PVP

PAINT and VARNISH
PRODUCTION

OP QUALITY-FAST DELIVERY

Dependable Product Protection With VULCAN'S

time - and - product - tested

STEEL PAILS-DRUMS

HI-BAKE
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● perfect fusion . . . full surface coverage . . . proper, uniform film thickness . . .

ALL from ONE DEPENDABLE SOURCE
COMPETITIVELY PRICED

LL SIZES — Pails, 1 through 13 gallons; rums, 13 through 65 gallons.

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● Baked-on Protective finishes. Pails and Drums beautifully Lithographed. Large Drums custom painted and printed.

● Quick delivery from stocked warehouses or "ready" pickup by Customer's trucks.

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*Main Office and Factory*

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ST

2-Nitropropane Solvent in Coatings...p. 33

PVP

# 9120 WALLPOL

## RCI's PVAc COPOLYMER WITH PROVEN DURABILITY ON EXTERIOR WOOD

This Rahway, N. J., home was coated with a 32% PVC vinyl copolymer emulsion paint to determine the durability of RCI 9120 WALLPOL on previously painted wood. Two coats were applied to the cedar shakes — in April, 1957. No primer was used. The shakes had been painted with linseed oil house paint two years earlier; the surface was in good condition and showed only slight chalking.

The photograph and the close-up attest to the condition of the house — 3 years later. The surface condition of the house is good, with only slight chalking on south and east exposures.

RCI 9120 WALLPOL incorporates all of the latest advances in PVAc emulsion technology. Small particle size, high distensibility and a uniquely balanced emulsifier system contribute to these distinct advantages when used on properly prepared exterior wood:

- *ease of application — spreads easily*
- *quick-dry — in as little as 30 minutes*
- *easy soap-and-water clean-up of tools and equipment*
- *retains its appearance for many years — excellent tint retention and low dirt pickup*
- *blister resistant — film allows moisture vapor permeability*
- *permanent flexibility — important for clapboard surfaces*

Write for complete information today, or ask an RCI technical service man to call.

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Synthetic Resins • Chemical Colors • Industrial Adhesives • Phenol
Hydrochloric Acid • Formaldehyde • Phthalic Anhydride
Maleic Anhydride • Ortho-Phenylphenol • Sodium Sulfite
Pentaerythritol • Pentachlorophenol • Sodium Pentachlorophenate
Sulfuric Acid • Methanol

*Creative Chemistry . . .*
*Your Partner in Progress*

RCI

**REICHHOLD CHEMICALS, INC.,**
**RCI BUILDING, WHITE PLAINS, N.Y.**

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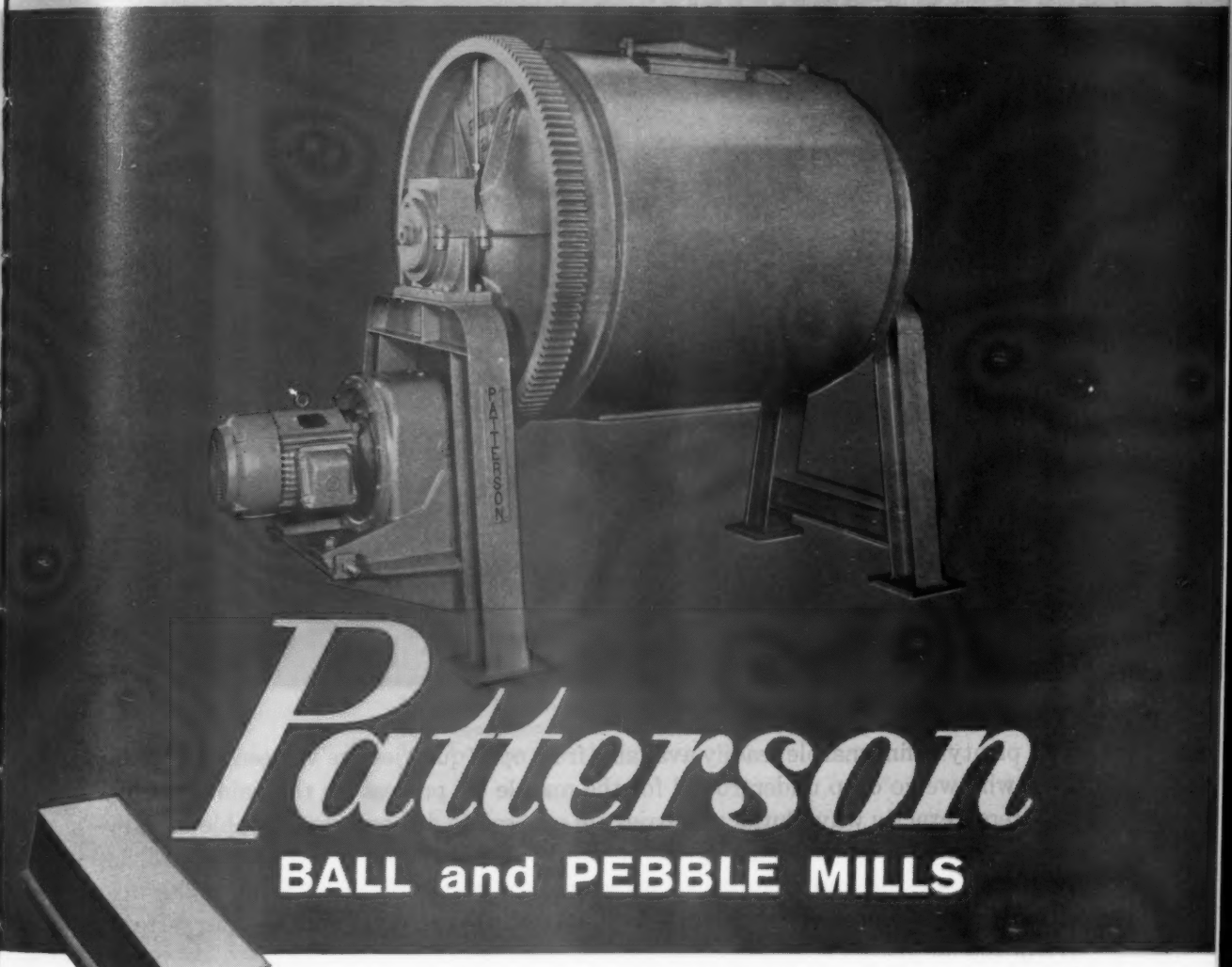
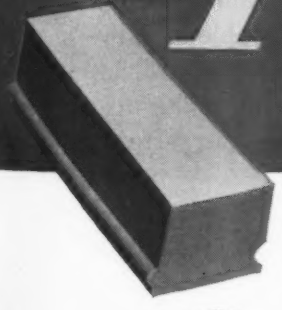
# PERFECTED OVER 80 YEARS OF DEVELOPMENT
# ALWAYS YOUR FINEST VALUE IN FINE GRINDING




# Patterson
## BALL and PEBBLE MILLS



Also from Patterson, **Quality Grinding Balls and Blocks**—standard Porox, high-density Arlcite, Buhrstone.

The latest Patterson DJ Pebble Mill is the product of modern development refined by the longest experience in the industry. It is designed to run in the millrooms of America's most exacting producers for a lifetime of profitable service . . . delivering the most uniform fine grinding with lowest maintenance yet achieved in this field. A Patterson Engineer is quickly available to give you the facts—and he's a good man to check your requirements with. Write!

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EAST LIVERPOOL, OHIO

With plenty of fine marble readily available from open quarries, we've been asked many times why we go deep underground for the marble we process for the paint industry.

Here's exactly why. Surface quarries are exposed to dirt and considerable contamination—some of which might remain with the marble when grinding processes are complete. But our famous marble mountains are *pure white marble*—by going deep within them, we protect the natural brilliance of the material and keep it perfectly free of foreign matter.

From this pure white crystalline marble—the world's finest—the following products are made: GAMACO*—GAMAKAL—CALWHITE*—KALMAC*—5-25—#10 WHITE—WINGDALE WHITE. The results: they help obtain high pigment loading while contributing to good color retention, enamel holdout, scrubability, exterior durability, pH stability and mildew resistance.

One or more is just right for your formulations.
We'll be glad to show you exactly why and how.

Plants in Tate, Georgia
and Wingdale, New York

**CPD CALCIUM PRODUCTS DIVISION**
**The Georgia Marble Company, Tate, Georgia**
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(REG. U.S. PATENT OFFICE)

AUGUST 1960

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOLUME 50
NO. 9

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*In Our 50th Year*

NEXT ISSUE

Paint Plant Maintenance will be featured in our September issue. Topics to be covered in this feature include plant safety and clean-up operations in the paint plant.

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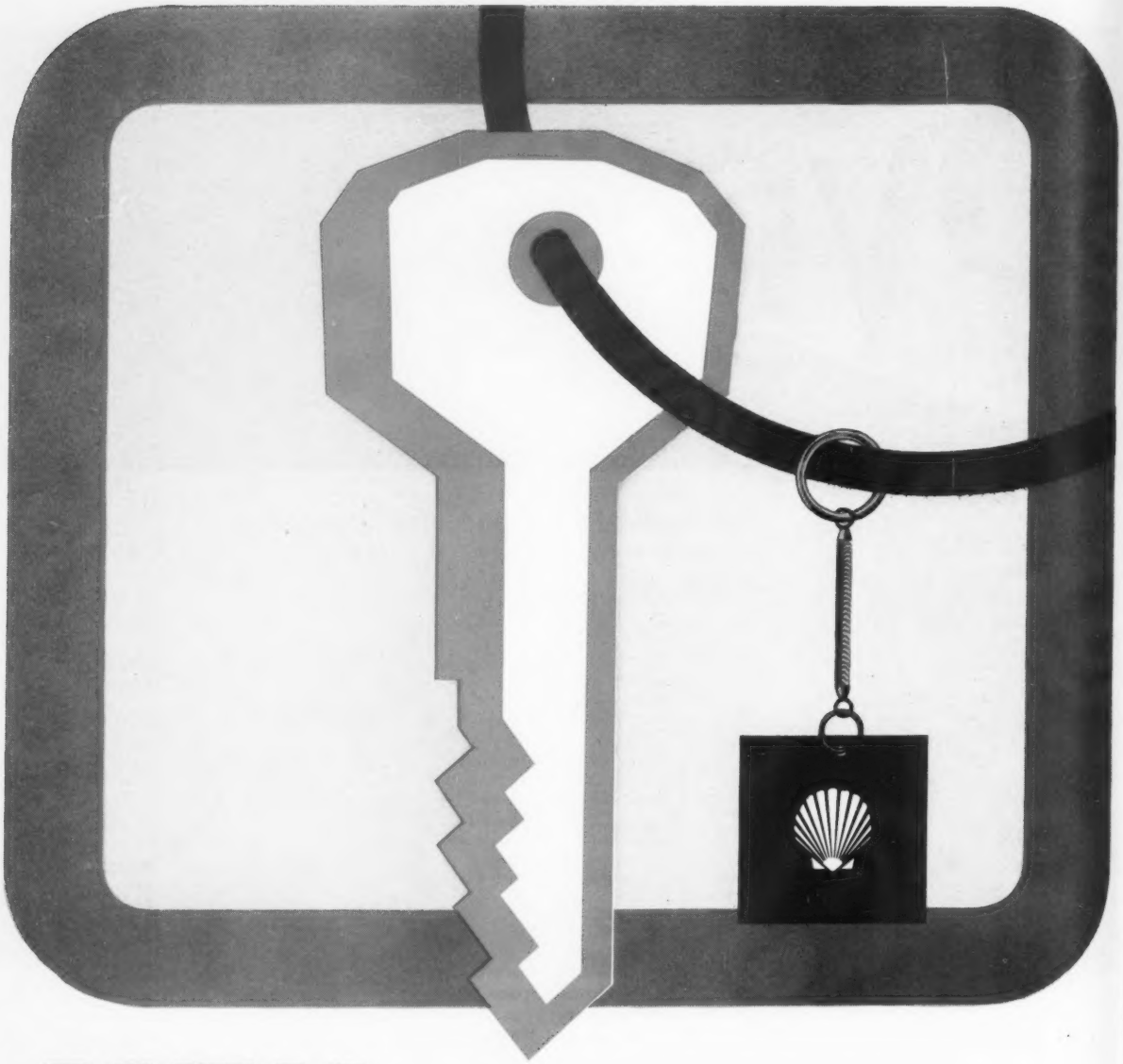

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Technical assistance, backed by years of experience, is available from Shell to assist you with surface coating problems. For more information, write or phone your nearest Shell Chemical office.

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SHELL

# EDITORIAL COMMENT

### A Step in the Right Direction

IT is indeed encouraging to note that the *Aluminum Siding Association*, heeding the recommendations of the *National Paint, Varnish and Lacquer Assoc.*, is making a real effort to stop the wild and exaggerated claims regarding the durability of aluminum siding. The aluminum siding industry has requested the Federal Trade Commission to call a trade practice conference that will outlaw such exaggerated claims and wild sales promotion practices by some over-zealous and sometimes irresponsible building material suppliers.

Responsibile for bringing about this movement are the manufacturers of finishes which are applied to aluminum sidings. In the form of a resolution, the Broad of Directors of the National Paint, Varnish and Lacquer Association went on record in opposing the exaggerated claims for such finishes.

In a letter to the Aluminum Siding Association, President J. F. Battley of NPVLA asserted that his members "strive at all times to maintain the highest quality for aluminum siding finishes as well as for all industrial product finishes" or chemical coatings as the paint industry refers to them.

"There is, however, a limit to the life of all matter, organic and inorganic as there is with paints and chemical coatings," he said.

"Even aluminum, durable as it is, will not last forever. Therefore, while we strive to produce the highest quality and longest lasting finishes, we are concerned when distributors of products finished with our coatings make unjustified and overly enthusiastic claims for them."

In reply the Aluminum Siding Association informed President Battley that "claims by irresponsible companies and salesmen are being brought to their attention constantly, but efforts to stop such advertisement claims have not met with much success."

Certainly the Federal Trade Commission's fair practices conference outlawing these unrealistic claims is in the best interests of the public—thanks to the persistent efforts of the National Paint, Varnish and Lacquer Association which has been vigorously behind this reform movement.

### Alkyds from Atomic Rays

RADIATION is fast becoming a useful tool in the chemical industry. By exposing ordinary plastics to intense radiation, new and improved products have resulted.

In the paint field, the Technical Committee of the New York Society of Paint Technology, through its subcommittee on Irradiation of Paint Materials, has shown that radiation can be used to heat-body drying oils and prepare an alkyd vehicle.

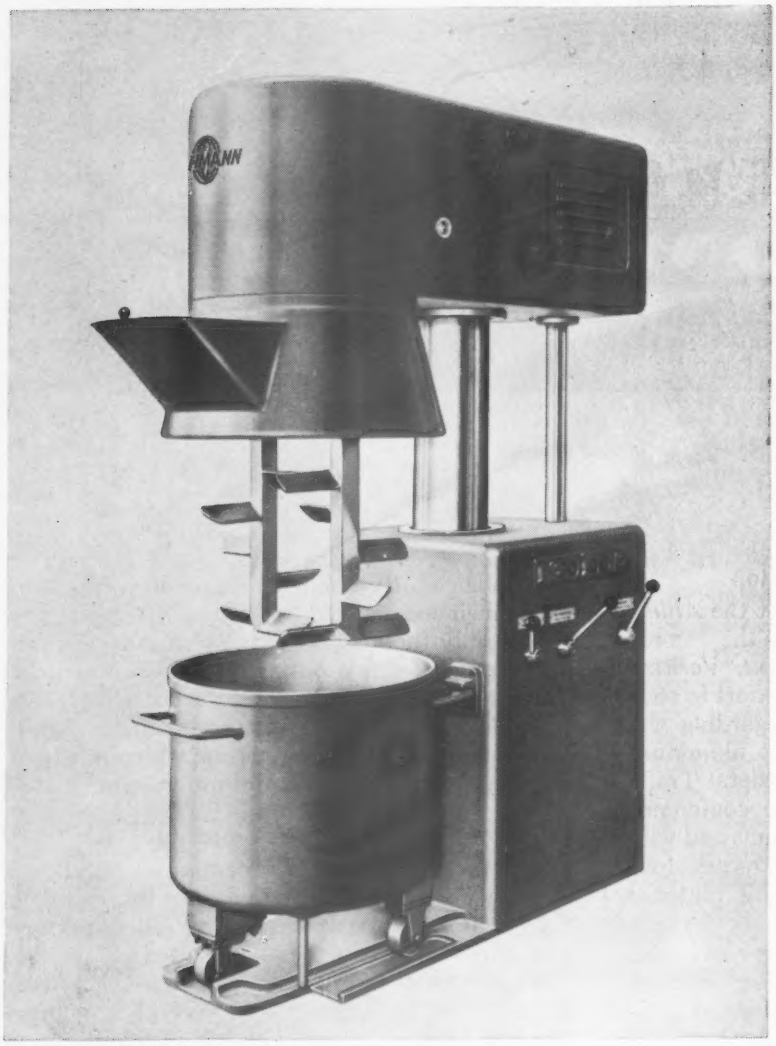
While work in this field is of only academic interest now, it presents a glimpse of the great industrial possibilities that massive radiation will have in the years ahead.

### A Million Dollars Worth of Ideas

A couple of months ago (June issue) in this column, we discussed the merits of an employee suggestion system.

You might be interested to know that the U. S. Steel Corp. paid over one million dollars for 31,888 ideas, since the beginning of its employee suggestion program in March, 1957. The ideas ranged from ways to save paper in the office to changes in the company's manufacturing methods—all of which resulted in substantial savings in operating costs plus improved plant efficiency and safety.

Quite evidently the suggestion system is paying off for U. S. Steel.



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PUBLISHER
JOHN POWELL

EDITOR
ANTHONY ERRICO

EDITORIAL STAFF
Marvin C. Feinstein, *Assistant Editor*
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Powell Magazines Inc., 855 Ave. of the Americas, New York 1, N. Y. BRyant 9-0497

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R. D. Henriquez & Associates, 549 W. Washington St., Chicago 6, Ill. Central 6-1626.

*West Coast*
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**Shell Sol 71 and 72** . . . have no odor, are ideal for interior finishes, polishes and cleaners. Shell Sol 71 offers slightly faster evaporation.

**Shell Sol 360** . . . much faster evaporation than mineral spirits, low odor, over 100°F. flash point.

**Shell Sol 140** . . . a high-flash, slower drying solvent with unusually low odor.

**Shell Mineral Spirits** . . . traditional distillation range, solvent power and drying. Mild odor.

Typical properties of these Shell Solvents are contained in booklet shown. It will be mailed on request.

**FACT—FROM SHELL RESEARCH**

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**THE ORIGINAL FAST-WETTING ZINC OXIDE**

•

***First Introduced May, 1955***

This announcement advertisement first appeared in the American Paint Journal, May 16, 1955. Subsequent publications and dates include: Paint, Oil & Chemical Review—May 19, 1955
Western Paint Review—June, 1955
Paint Varnish Production—June, 1955
Official Digest—July, 1955

# NEW!

## EAGLE-PICHER 414 ZINC OXIDE

***wets easier, faster! reduces oil demand!***

Now, after years of extensive research and development in the Eagle-Picher laboratories, the new 414 Zinc Oxide has been "fence-tested" and proved. It provides these unique and highly desirable features in your house paint formulations:

- **Reduced oil demand! Saves money!**
- **Increased gloss retention!**
- **Superior mildew resistance!**
- **Improved blister resistance!**
- **Greater film flexibility!**
- **Easier, more uniform brushing qualities.**

**AND REMEMBER...**
Eagle-Picher maintains rigid quality control from ore to finished pigment . . . and as the largest producer of *both* zinc and lead pigments, provides unequalled and unbiased customer service.

*Since 1843*

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**THE EAGLE-PICHER COMPANY**
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444 Market St., San Francisco 11, California • 1329 Willow St., Los Angeles 13, California

May 16, 1955

Introduction of this original fast-wetting Zinc Oxide was another Eagle-Picher first. It was made possible by Eagle-Picher's extensive research and use-testing program . . . which continues, year after year, to bring new products to the Paint industry with *success built-in!*

*Since 1843*

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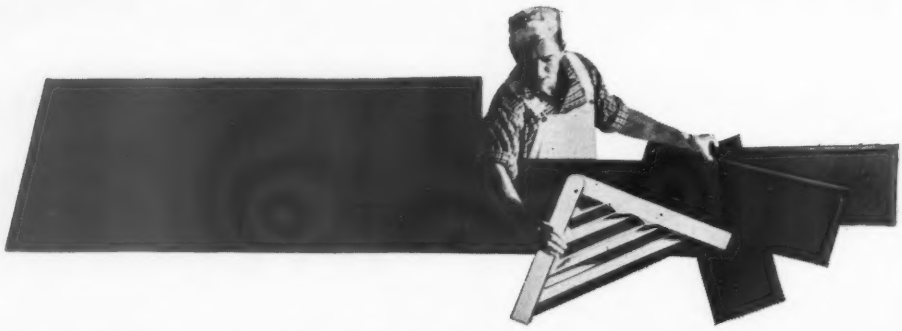
***Another new development using***

# B.F.Goodrich Chemical *raw materials*



## Geon helps aluminum build the **house of ease***

*Reynolds Metals Company, Richmond, Virginia, applies coatings of Geon to aluminum for fabrication into the products you see here and many others for use in homes and other products. B.F.Goodrich Chemical Company supplies the Geon vinyl.*

Now, nearly every exposed part of a house can be made of aluminum coated with Geon vinyl. *Shingles, siding, soffits, gutters, downspouts* and *storm* and *screen doors* are all providing homeowners a new kind of easy living.

Because the enamel-like finish is made of Geon, colors will never fade and will last far, far longer. There'll be no cracking, no crazing, no chipping—none of the worries that bother homeowners with maintenance problems. No rusting either.

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Here are several excellent examples of how manufacturers are taking advantage of the unusual properties of Geon vinyl on aluminum to open new markets and improve existing products. To learn more, write Dept. GP-5, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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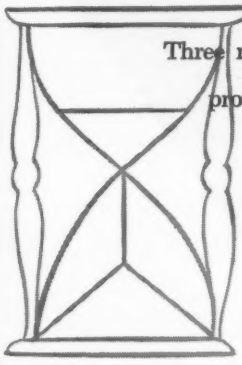
**a division of The B.F.Goodrich Company**

*Your best defense against the elements*

# New FR* Chrome Yellows



Three new chrome yellows
provide outstanding resistance
to darkening on exterior exposure

FAST PRIMROSE FR 2100

FAST LEMON FR 2101

FAST MEDIUM FR 2103

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City _____ Zone ____ State ____

Your Name _____

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- Ninety-five years' experience serving the marketing needs of American agriculture.
- Advanced research for the coatings industry.

Even if you can't use a barge-load, Cargill has products that will add a plus to your paints—soybean oils, raw or refined; non-break, blown and heat-bodied; Cargill *Falkosoy* and Cargill *HiDry* maleic soybean oils. They're available in *any* quantity. Call your local Cargill office or write:

CARGILL

## CARGILL, INCORPORATED

200 Grain Exchange, Minneapolis, Minnesota, Dept. 102

*basic supplier to the coatings industry*

# 2-NITROPROPANE!

## The remarkable solvent that brightens the day for more and more hard-working formulators.

2-NP ($CH_3CHNO_2CH_3$) is an extraordinarily versatile member of the CSC Nitroparaffin family. Its most important property is its strong solvent power for a wide variety of materials including many natural resins, synthetic resins, coating materials, dyes, organic chemicals and fats and oils. Of special interest is the cosolvent effect of 2-NP and/or toluol and alcohol, making it an outstanding solvent for many vinyl resins and acrylics. It is a superior solvent for epoxies and cellulosics.

2-NP is to the newer coatings what butyl acetate has been to nitrocellulose – an ideal solvent. 2-NP's evaporation rate permits maximum flow and leveling without delaying drying time.

Unlike ketones, 2-NP in vinyls eliminates problems of solvent residue and solvent odor, too. It has several safety features such as relatively high flash point and a high lower-flammability limit of vapors in air. Write for all the literature that details how CSC's 2-Nitropropane can brighten your day.

**Evaporation Rate of 2-NP Compared to Other Solvents (volume)**

| | |
|---|---|
| Acetone | 975 |
| MEK | 568 |
| Toluol | 197 |
| MIBK | 186 |
| 2-NP | 110 |
| n-Butyl Acetate | 100 |
| Xylol | 69 |
| Cellosolve | 38 |
| Isophorone | 4.3 |

**Flash Points (°F Tag Open Cup) of 2-NP Compared to Other Solvents**

| | |
|---|---|
| Acetone | 16 |
| MEK | 30 |
| Toluol | 56 |
| MIBK | 81 |
| Xylol | 85 |
| n-Butyl Acetate | 92 |
| 2-NP | 103 |
| Cellosolve | 126 |
| Isophorone | 202 |

**Comparison of Lower Limit of Flammability of 2-NP With Other Solvents (% by volume in air)**

| | |
|---|---|
| MIBK | 0.9 |
| Xylol | 1.0 |
| Toluol | 1.27 |
| n-Butyl Acetate | 1.7 |
| MEK | 1.8 |
| Acetone | 2.15 |
| 2-Nitropropane | 2.6 |
| Cellosolve | 2.6 |

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**COMMERCIAL SOLVENTS CORPORATION**

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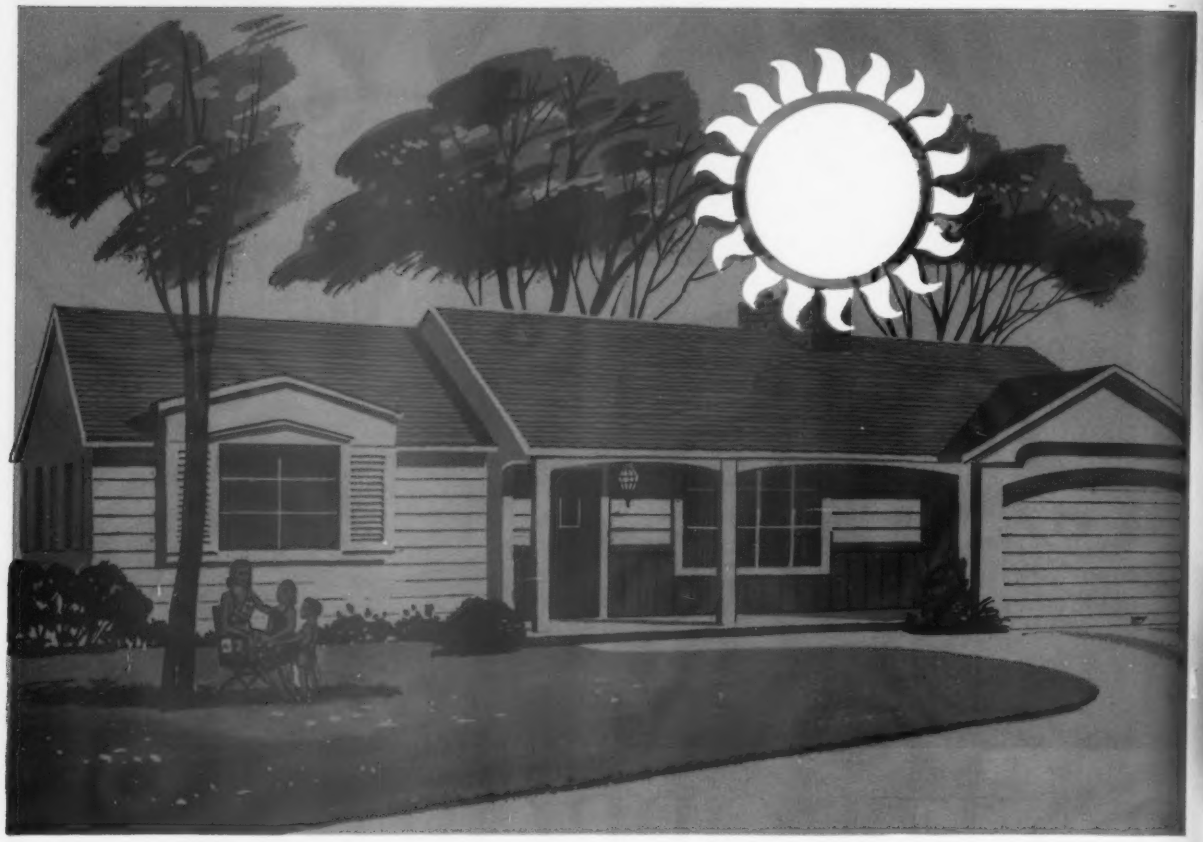

# *Weatherproof*

## Your paint with **Minnesota** Linseed Oil...

● On hot days the sun seems much bigger. It makes its presence felt. It can get too hot to work . . . too hot to play . . . even too hot to sleep. On poorly painted and unprotected wooden surfaces, the sun acts like a hot air furnace. It sucks moisture through the siding leaving timber tinder-dry. With old paint, the sun causes paint blisters and cracks, opening the building's "skin" to erosion by wind and rain. But take a home protected by quality paint . . . paint made with Minnesota Linseed Oil base. Time has proved that linseed oil paints can withstand blistering and cracking best of all. Why not find out for yourself why Minnesota brand linseed oil is best for purity, for quality control and dependability?

OUR 90th YEAR

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**Minnesota**

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803 Hoffman Bldg.

**PITTSBURGH, PA.**
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# Surface coating improvements possible with New Dimer Acids

Dimer acid, already widely used in the surface coating industry, now has even greater potential with the introduction by Emery Industries of two new commercial grades, Empol 1014 and Empol 1024. Like the present standard commercial grade, Empol 1022, they are a mixture of dimer acid ($C_{36}$ aliphatic dicarboxylic acid), trimer acid ($C_{54}$ aliphatic tricarboxylic acid), and $C_{18}$ monobasic acids.

## New Low-Monobasic Grade

Empol 1024 is a low-monobasic acid (1% max.) version of Empol 1022 (approx. 75% dimer, 22% trimer, 3% monobasic). The less than 1% monobasic acid content of Empol 1024 is a valuable characteristic in resins where minimum chain-stopping is required.

## High Dimer Grade

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## Advantages of Dimers

Because dimer acid can be used as both the dibasic acid constituent or the fatty modifier, it is unique in the surface coating industry. It has been used as a modifying agent in alkyds, varnishes and bodied oils. Essentially a pre-polymerized fatty acid, it shortens kettle time and increases through-dry. Replacement of part of the phthalic or maleic anhydride increases flexibility and toughness. The 75:22:3 composition of Empol 1022 is excellent for these applications. The 22% trimer acid provides sufficient cross-linking, but still allows the incorporation of a sufficient amount of Empol 1022 before gellation occurs.

## Polymer Applications

For formulations where 3% monobasic provides excessive chain-stopping, Emery offers Empol 1024. This contains 75% dimer for linearity, 24% trimer for cross-linking, and less than 1% chain-stopping monomer. For linear polymers, Emery's Empol 1014 with 95% dimer performs essentially like a long-chain member of the adipic-azelaic-sebacic family. Also, it increases the amount of dimer that can be incorporated in resins before gellation occurs.

Emery also has a 75% trimer under development for surface coating uses that require extensive cross-linking for flexibility and toughness. Drum quantities can be delivered with reasonable notice.

## Price Reduction

The price of Empol 1022 was recently lowered to 25¼¢ per pound. Prices for the new dimers delivered in tankcar lots east of the Rockies are 26¢ per pound for Empol 1024 and 35¢ for Empol 1014 (a reduction of 10¢ per pound from its development tag).

Further information on these dimers is available from Emery. Request Technical Bulletin No. 418 covering the new acids or Emeryfacts "Empol 1022 Dimer Acid" from Emery Industries, Dept. X-8 Carew Tower, Cincinnati 2, Ohio.

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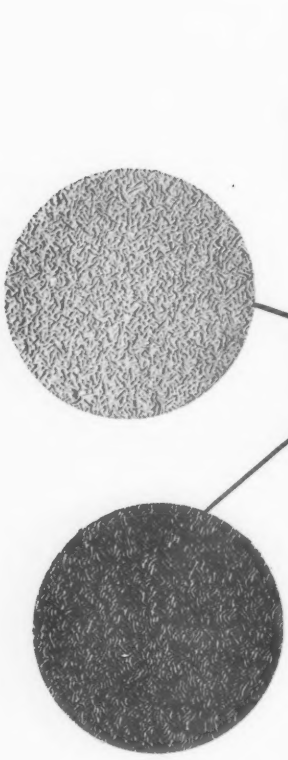

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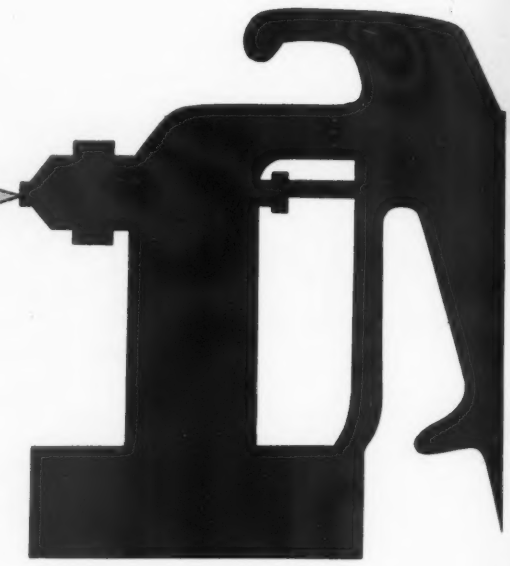

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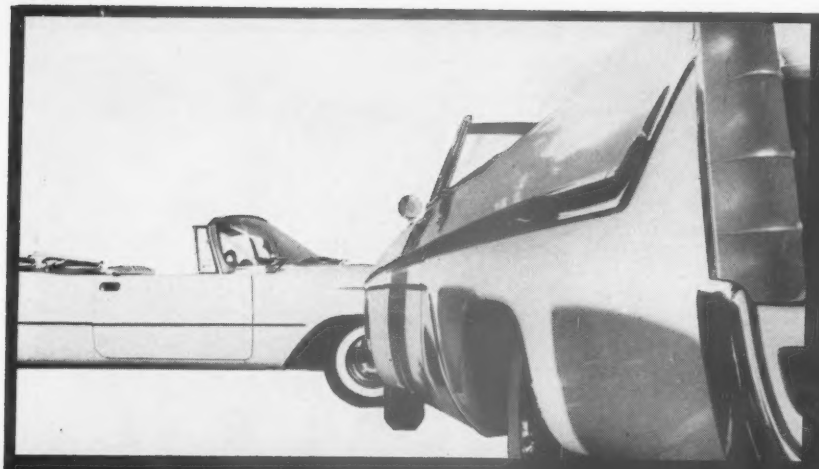

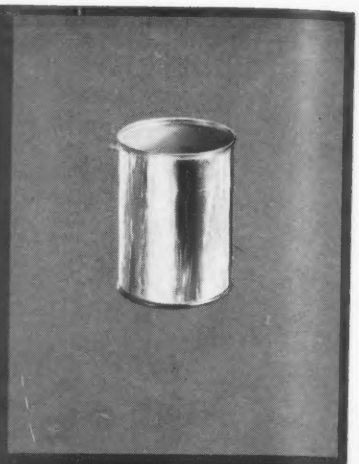

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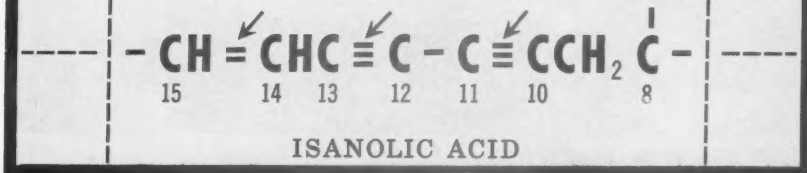


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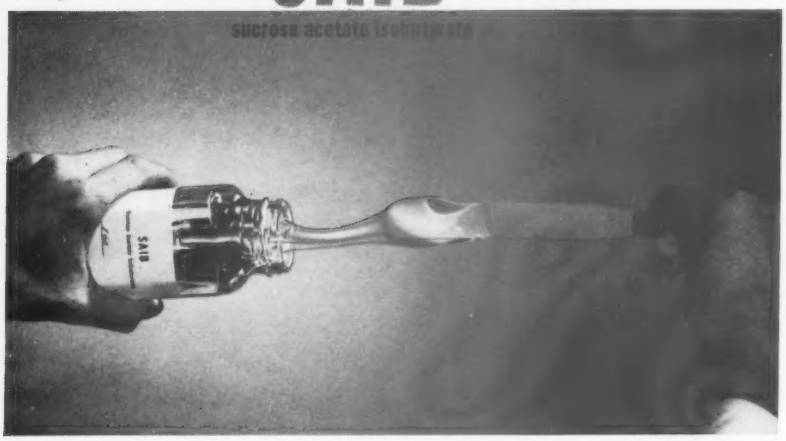
# Unique function of SAIB aids lacquer formulators




*SAIB has a molecular weight of 838. At room temperature, it is a semi-solid. Its color is exceptionally light and its color stability upon exposure to heat or ultraviolet light is excellent. (Heated to 175°C. for a period of 6 days, its color increases slowly to straw yellow, with no appreciable change occurring until after 24 hours of heat-aging.) SAIB is unaffected by contact with bronze powders. It is compatible with a wide variety of polymers, modifiers and plasticizers and is highly soluble in most common solvents. (A 90% solution of SAIB in ethyl alcohol has a viscosity of only 750 centipoises at 30°C.)*

### SAIB increases solids content

The high degree of compatibility exhibited by SAIB with virtually all major film-formers coupled with its exceptional solubility in common lacquer solvents *(see table below)* permits formulation of high-solids lacquers at practical application viscosities.

**Viscosity of 50% SAIB Solutions**

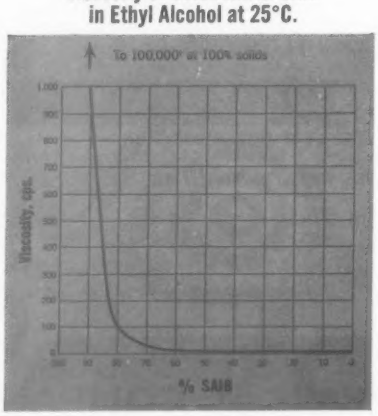
*(Brookfield viscometer, 25°C.)*

| *Solvent* | *Viscosity, cps.* |
|---|---|
| *Ethyl alcohol* | 8 |
| *Isopropyl alcohol* | 14 |
| *Ethyl acetate* | 8 |
| *n-Butyl acetate* | 9 |
| *Toluene* | 9 |
| *Hexane* | 6 |
| *Methyl ethyl ketone* | 6 |
| *Methyl isobutyl ketone* | 8 |
| *1-Nitropropane* | 11 |

### SAIB improves film properties

One of the most significant characteristics of SAIB is its effect on film hardness at high modification. With nitrocellulose, for example, the Sward hardness of a 50% SAIB-modified film is increased from 65 to 78. Higher modification yields softer films. Cellulose acetate films also are increased in hardness upon addition of SAIB. In this case, however, maximum hardness occurs at a concentration of about 25%. With cellulosic films other than nitrocellulose and cellulose acetate, high modification produces only a slight decrease in hardness with no significant change in solution viscosity.

**Viscosity of Solutions of SAIB in Ethyl Alcohol at 25°C.**




Other film properties can often be improved. Plastic lacquers formulated with Half-Second Butyrate and SAIB, for example, show very good adhesion to Mylar polyester film and nylon. Such lacquers can also be made heat-sealable. Vinyl and acrylic solutions when modified with SAIB show improved sprayability and less tendency toward cobwebbing, with no significant change in viscosity.

Good flexibility in many SAIB-modified polymers can be achieved by including small amounts of Eastman polymeric plasticizer NP-10.

### How does SAIB function in lacquer systems?

Note that the room-temperature viscosity of a solution of SAIB in ethyl alcohol remains below 10 centipoises up to 50% solids, increasing to only 100 centipoises at 80% solids *(see graph)*. At this point, however, the viscosity increases sharply to the 100,000+ level of pure SAIB. A similar relationship exists between SAIB and other common lacquer solvents.

At the highest conceivable concentration at which SAIB might be used to modify a lacquer system, therefore, its effect on application viscosity is negligible. Even after much of the solvent has evaporated from the film, SAIB does not hinder flow-out or leveling. While this phenomenon might also be observed with certain plasticizers, SAIB does not exhibit plasticizing properties, hence its very limited effect on the resulting film.

Because of its unique behavior, plus its low color, stability and reasonable cost, SAIB offers a new approach to lacquer formulation. It is supplied both as a 90% solution, designated *SAIB-90*, and in the undiluted form, designated *SAIB*. For a sample of SAIB, as well as a technical report on its physical properties and performance in coatings, write your nearest Eastman sales office or EASTMAN CHEMICAL PRODUCTS, INC., Chemicals Division, KINGSPORT, TENNESSEE.

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**SUCROSE ACETATE ISOBUTYRATE**

**Eastman** CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company

# USE OF 2-NITROPROPANE SOLVENT IN PROTECTIVE COATINGS

By
R. F. Purcell*

EFFECTIVE use of solvents that will utilize their full potential value in a formulation is an ideal seldom attained. While it may be true that a formula will still perform satisfactorily if a direct substitution of one solvent for another is made, the solvency characteristics and physical properties of solvents vary and some change is bound to take place in a coating when a substitution is made. If advantage is to be taken of the improvements in film properties which can be obtained through proper use of solvents, they must be properly used.

**Properties**

2-Nitropropane is an excellent example of a solvent which if improperly used will often lead one to a mistaken opinion of its value in a formulation. The physical properties of 2-nitropropane as shown in Table I indicate a number of areas where there is considerable difference between 2-nitropropane and other commonly used medium evaporating solvents. The flash point of 2-nitroporpane is higher than might be expected for a solvent in this evaporation rate range. 2-Nitropropane also has a relatively high lower limit of flammability which coupled with the flash point of 103°F. offers advantages in many types of coatings. 2-Nitropropane is classified as a medium evaporating solvent as are n-butyl acetate and methylisobutyl ketone. MIBK is, however, 70% faster evaporating than 2-NP and n-butyl acetate is about 10% slower. 2-Nitropropane is also essentially anhydrous and exhibits a very low tolerance for water.

Another property of 2-nitropropane which must be considered when formulating is its higher specific gravity. On the surface this would appear to be a considerable disadvantage, but it has been found that the problem is largely mental when 2-nitropropane is used correctly. A given quantity of solids can be transported in a given volume of liquid with 2-nitropropane as well as with a solvent having a lower density, and this can be done more often than not at a savings in overall solvent cost. As has been pointed out,[1] the value of a coating in terms of coverage or mileage is not a function of weight percent solids; but rather one of the quantity of solids being transported by a given volume of liquid.

**Solvency**

The solubility parameter of 2-nitropropane, which can be used to explain many solvency characteristics, is 10.25 which is higher than most common solvents. 2-Nitropropane is also a poorly hydrogen bonded solvent. These

| | 2-Nitropropane | MIBK | n-Butyl Acetate |
|---|---|---|---|
| Molecular weight | 89.09 | 100.16 | 116.16 |
| Evaporation rate, by vol. | 110 | 186 | 100 |
| Boiling point, °C. | 120.3 | 116.0 | 126.1 |
| Vapor pressure at 20°, mm. | 12.9 | 15 | 10 |
| Specific gravity at 20/20°C. | 0.992 | 0.802 | 0.876 |
| Weight per gallon at 68°F., lb. | 8.24 | 6.68 | 7.29 |
| Flash point, TOC, °F. | 103 | 81 | 92 |
| Heat of vaporization at 30°C., cal/g. | 104 | 93.2 | 83 |
| Solubility in water at 20°C., % by vol. | 1.7 | 2.0 | 0.5 |
| Solubility of water in solvent, % by vol. | 0.6 | 1.8 | 1.6 |

Table I. Physical properties of some medium evaporating solvents.

*Research Dept., Commercial Solvents Corp.

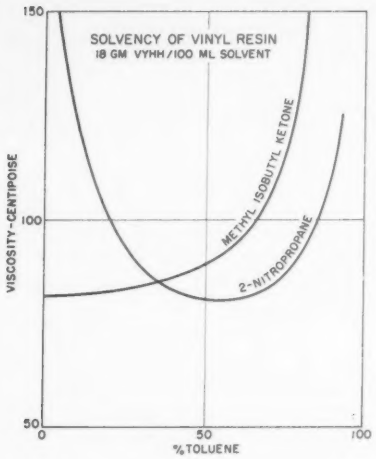


Figure 1

two factors allow a great amount of flexibility in the use of 2-nitropropane in solvent formulas. They can also cause some grief if they are not recognized, since 2-nitropropane often shows solvency characteristics much different than other solvents.

While 2-nitropropane will dissolve a great many resins it has been found that peak solvency is often reached when 2-nitropropane is used in combination with some other solvent. Two examples which show this difference are the effect of an aromatic diluent in vinyl chloride-acetate copolymer solutions, and a comparison of n-butyl acetate, methylisobutyl ketone, and and 2-nitropropane dilution ratio curves with n-butyl alcohol.

In the case of the vinyl copolymer 2-nitropropane will dissolve a number of these materials when used alone. As can be seen in Figure 1, however, the viscosity is quite high until some aromatic diluent is added. Unlike the ketone, the viscosity of the 2-nitropropane solution becomes less until peak solvency is reached with equal parts of toluol and 2-nitropropane.

The second example of this difference in solvency is illustrated in Figure 2. The peak on the dilution ratio curve for 2-nitropropane is reached in a solvent blend containing roughly equal parts of 2-nitropropane and n-butanol. This blend contains considerably more alcohol than that representing the peak with either of the other solvents.

**Solvent for Vinyls**

In using 2-nitropropane we have found it to be an excellent solvent for most of the vinyl chloride-acetate copolymer resins and in solution vinyl formulations. Not all of the resins are soluble in 2-nitropropane alone, however. Curves, Figure 3, showing viscosities of VYHH solutions in various solvents show that while there is a sharp increase in viscosity shown with high concentration of either 2-nitropropane or the diluent there

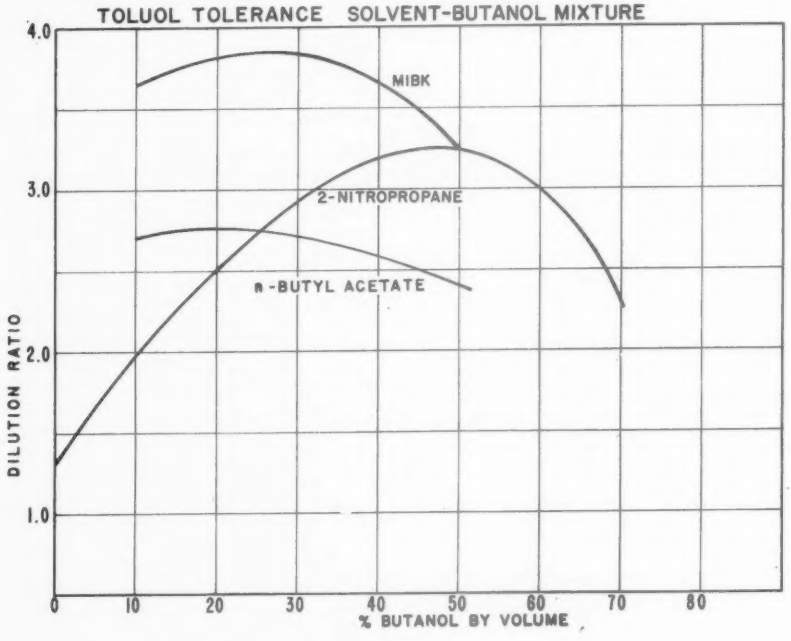


Figure 2

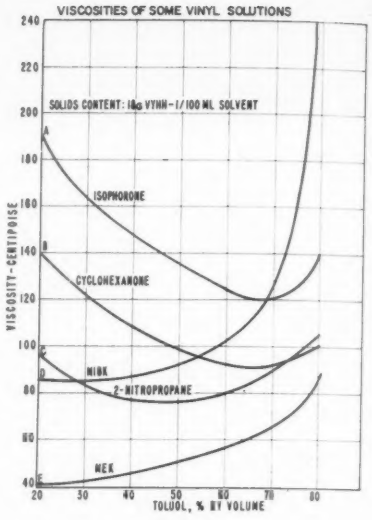


Figure 3

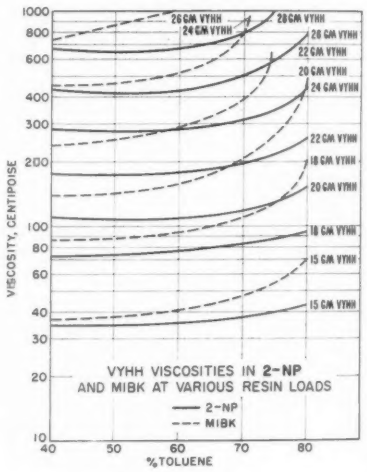


Figure 4

is a rather broad area of the curve where only minor viscosity variations are found. The economy of using 2-nitropropane in vinyls comes with the increased amount of diluent which can be used while maintaining viscosity and application properties. At a solids level of 18 grams VYHH per 100 ml. of total solvent, a blend of 30 parts 2-nitropropane and 70 parts toluol will give a viscosity approximately equal to that obtained at the same solids with equal parts of MIBK and toluol. Excellent stability of higher solids 2-nitropropane solutions of VYHH, as indicated in Figure 4, is obtained. This better stability is found even at higher diluent concentrations of 50 to 70% by volume of the total solvent. It should be noted also that the 2-nitropropane curve is more similar to that of isophorone

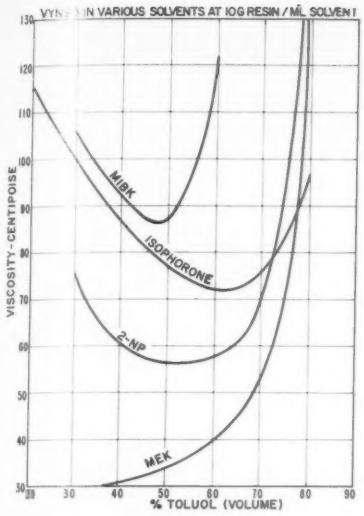


Figure 5

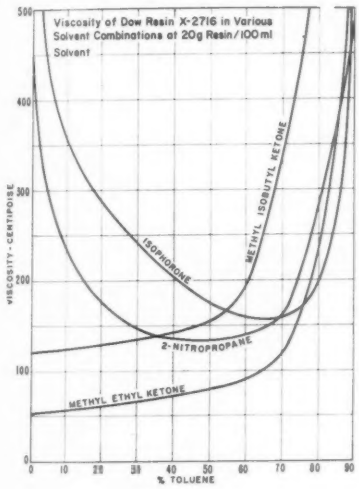


Figure 6

or cyclohexanone. This coupled with the slower evaporation rate of 2-NP suggests its usefulness with these slower solvents in roller coat applications.

VYNS-3 is a chloride acetate resin which is not soluble in 2-nitropropane alone, and at least 30% aromatic diluent is needed to obtain a solution. Figure 5 shows viscosities of VYNS-3 solutions in various solvents. Again, 2-nitropropane has the same characteristic curve such as was noted with VYHH, and the advantages of 2-NP as a medium evaporating solvent for this resin are apparent. As the chloride content of these vinyl copolymers increases above that of VYNS-2, 2-nitropropane becomes a progressively poorer solvent. It can be used to advantage with polyvinyl chloride resins, however, as a solvent for modifying resins used in the system. In this case it is best to blend the solutions.

Advantages of 2-nitropropane in vinyl chloride-vinylidene chloride resins are similar to those found in the straight chloride acetate copolymers. Viscosities of Dow's X-2716 which is an example of this type resin are shown in Figure 6.

Modification of vinyl chloride-acetate resins with reactive groups such as the carboxyl group introduced in VMCH or the hydroxyl group in VAGH tends to reduce the solubility of these resins in the poorly hydrogen bonded 2-nitropropane-aromatic system more than in ketone systems. As Figure 7 shows, viscosity curves of these resins in 2-nitropropane-toluol blends are steeper than the VYHH curve, and the lowest point comes at a higher 2-nitropropane concentration.

With VMCH the effect of the reactive group is not as great and shows up principally in the stability of solutions containing large amounts of diluent. The use of some ketone with 2-nitropropane in these solutions is sufficient to correct the solvent balance with this resin. Methyl ethyl ketone as a portion of the solvent in spray formulations or the use of 2-nitropropane with isophorone in roller coat application is in line with common formulation practice. Figures 8 and 9 show the effect on viscosity of VMCH solutions with 2-nitropropane, MEK or isophorone blends.

With VAGH the range where clear solutions are obtained with 2-

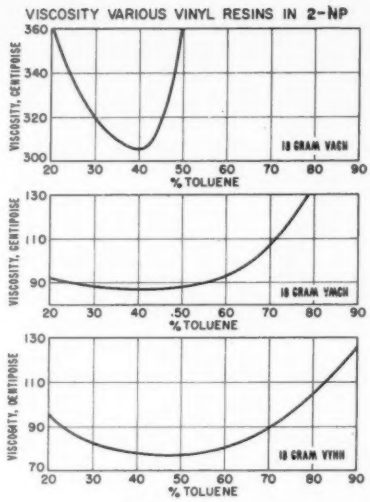


Figure 7

nitropropane, toluol blends is quite narrow, and viscosities are high. Addition of a more highly hydrogen bonded solvent to the system makes a great difference in these curves, and when the resin system will tolerate 5 to 10% alcohol this is sufficient to increase the usable range of the solvent-diluent ratio and at the same time reduce solution viscosities. The effect of alcohol in VAGH systems is shown in Figure 10. In examining these systems we have found the effectiveness of the alcohols to be a function of their chain length. In cases where alcohol cannot be used in the system because of its incompatibility with the resins used, ketones can be used as with VMCH. As little as 10% MEK in the system with 2-nitropropane and toluol has a large effect on the solution viscosity, see Figure 11.

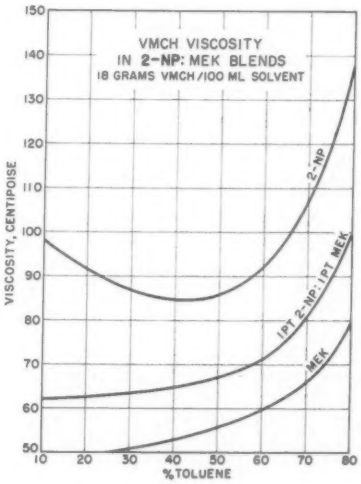


Figure 8

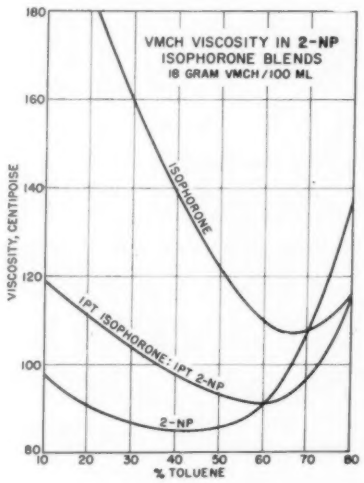


Figure 9

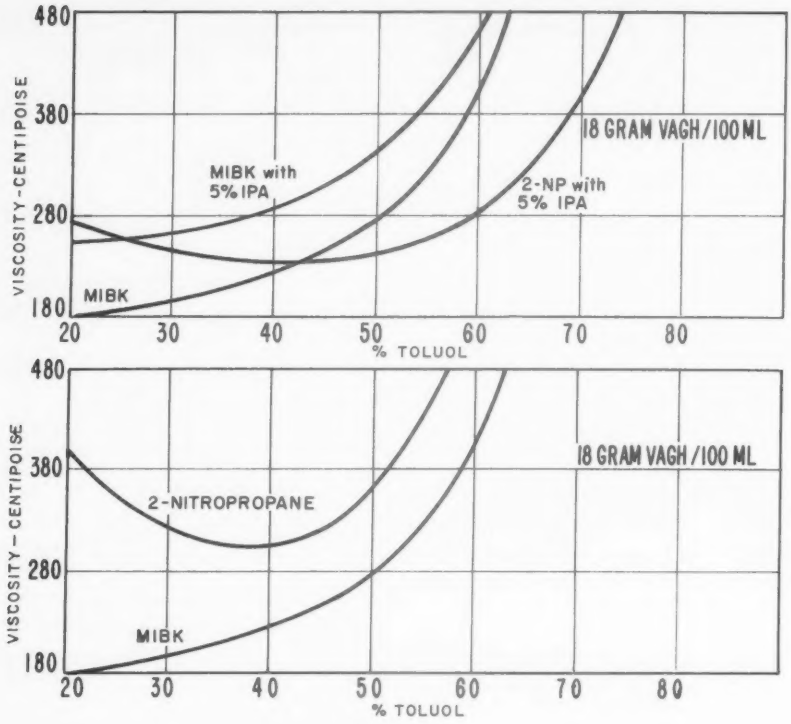


Figure 10

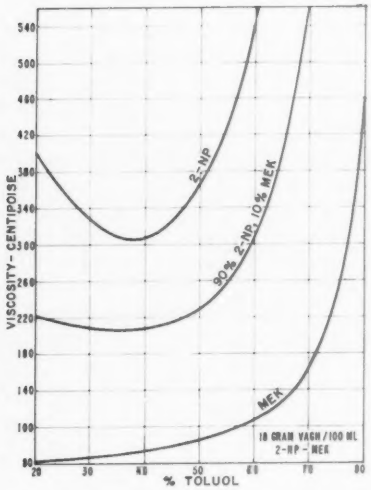


Figure 11

**Solvent for Epoxies**

Epoxy coatings is another area where 2-nitropropane is an extremely useful solvent. In general, advantages obtained through proper use of 2-nitropropane in epoxy formulations include better water resistance, improved chemical resistance, and improved application properties. As was the case with vinyls, however, 2-nitropropane must be properly used if these advantages are to be obtained.

Epoxy resins having an epoxide equivalent below 1000 are generally soluble in 2-nitropropane. As the resin begins to cure, however, a solution in 2-nitropropane will cloud unless some alcohol is present. While a resin solution in 2-nitropropane is very stable, alcohol must be present in the formulation after the curing agent has been added. Higher molecular weight resins are not soluble in 2-nitropropane unless alcohol is present in the solvent blend.

Amine or room temperature cured systems were the first epoxy coatings where 2-nitropropane was utilized. In these systems one of the early places where improvement was noted through the use of 2-nitropropane was chemical resistance of clear films. This improvement is particularly great in exposure of the film to nitric acid. Similar improvement is shown with most other acids, but is not as pronounced in most cases. It was later found these same improvements are present in pigmented films. Striking improvement in water resistance is also noted in epoxy films cast from 2-nitropropane solvent systems and this has been measured either as lower water vapor permeability or in immersion tests. Cratering and pinholing are common problems in these systems and this is another area where solvent blends containing 2-nitropropane have been shown to give improvement.

**Effect on Film Properties**

Considerable variation in film properties is possible in these coatings through solvent formulation. A 2-nitropropane formula such as the following has proven to be a good starting point in most cases, however.

| | |
|---|---|
| 2-nitropropane | — 33 by weight |
| n-butanol | — 33 |
| xylol | — 34 |

In formulating room temperature cured epoxy coatings with 2-nitropropane we have found that when amine curing agents are being used the higher molecular weight polyethylene polyamines such as triethylene tetramine or tetraethylene pentamine are preferred over lower molecular weight materials. Polyamides or prepolymers perform well in 2-nitropropane systems. When packaging two component systems, however, it is not recommended that the amine portion be packaged in a solvent containing 2-nitropropane since considerable color will develop on storage.

Improvements in film properties similar to those obtained in air dried amine cured systems are found when 2-nitropropane is used with the higher molecular weight resin baking systems. In urea-formaldehyde modified systems choice of the modifying resin has a great deal of influence on the solvent system which may be used. 2-Nitropropane can be used successfully with a wide range of urea-formaldehyde resins and a formula such as the following has given excellent gloss, flow, and chemical resistance with a large number of these resins.

| | |
|---|---|
| 2-Nitropropane | — 22% by volume |
| MEK | — 22% |
| Isopropyl alcohol | — 6% |
| Toluol | — 50% |

It has been found that it is necessary to keep the alcohol portion of these formulas below 10% of the total with some of the ureas, but with others this is more flexible.

In phenolic modified systems either of the following formulas

(*Turn to page 89*)

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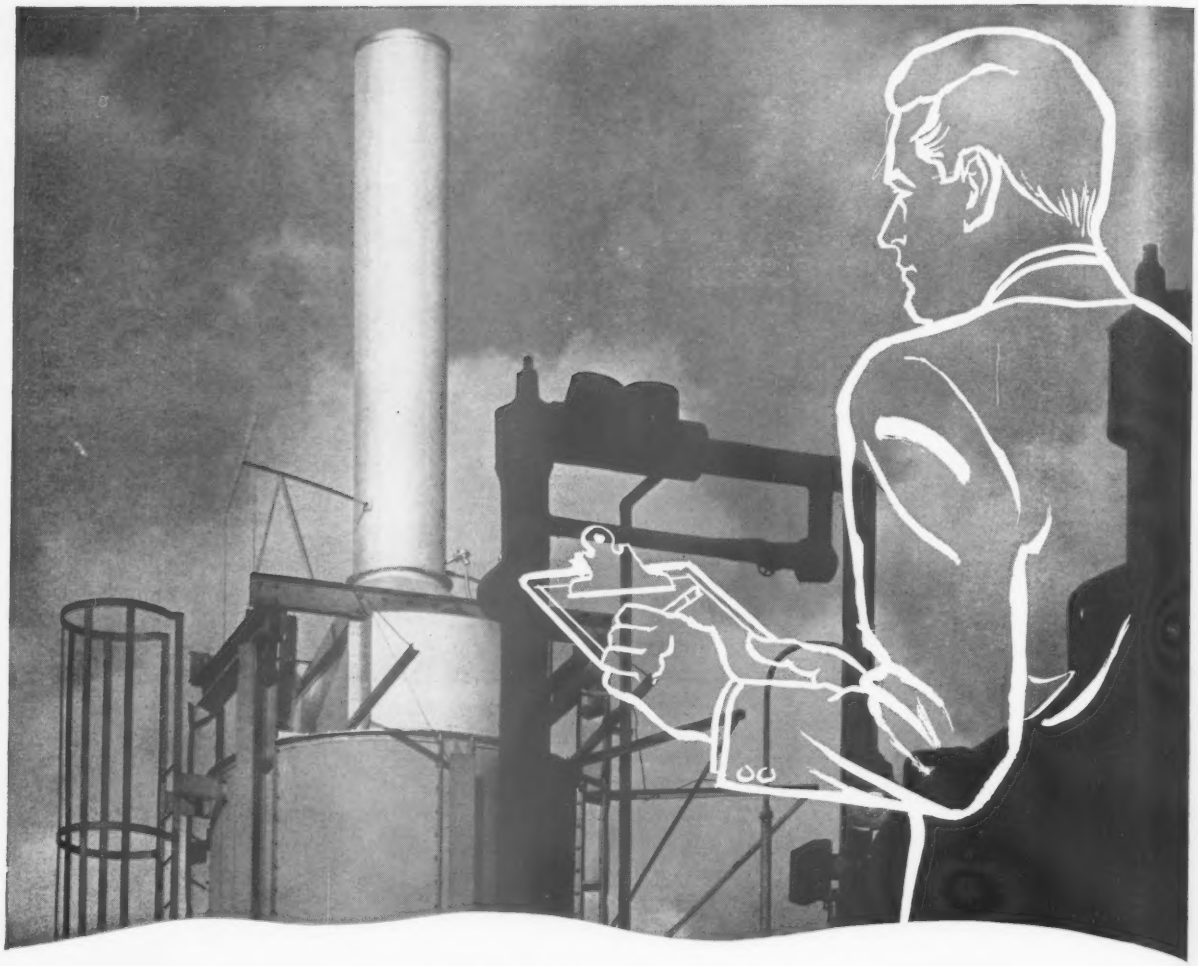

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**SILICONE NEWS from Dow Corning**

# Paint Tougher Than Nails

## New Silicone Paint Bakes At 350 F; Has Exceptional Weather Resistance

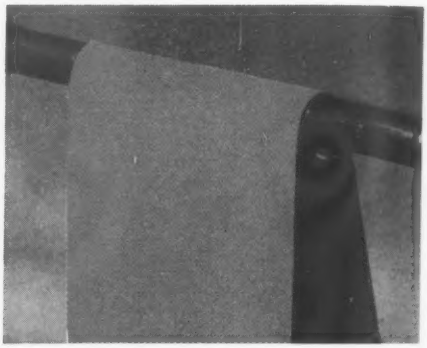
One of the newest Dow Corning resins formulates into a coating that's a real "toughie". It outlasts every good organic we test it against in Florida, retaining full color and gloss. In high temperature aging tests, paints based on this new resin withstand continuous 450 F without discoloring. In addition, this toughest of all silicone paint resin compares well with conventional resins for flexibility and adhesion.

Processing is simplified, too, with this new resin. Good film properties are obtained by curing the coating in temperatures ranging from 350 to 600 F, by adjusting exposure time.

Weathering — punishing snow, rain, sun, salt spray — has no harmful effects, either. Paints based on this new resin outlast 'em, sealing destruction away. Aluminum siding, hardware and some outside appliances are a few applications where such a paint would be advantageous.

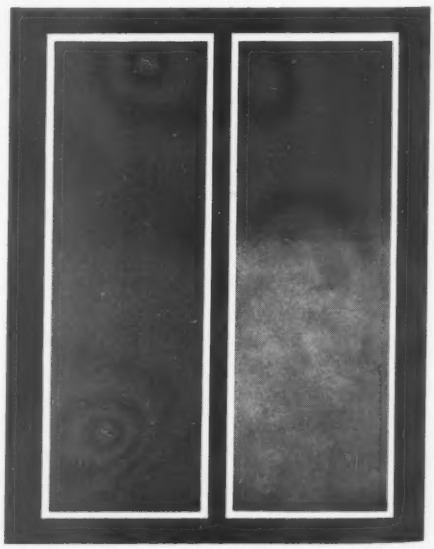
Another plus: as with many paints based on Dow Corning Silicones, this new resin can be formulated into a full range of colors. In product finishes, such silicone paints provide more durability as well as heat resistance where needed.

The "proof is in the painting". Why not try your own thumb nail test on a paint based on this new Dow Corning silicone resin? For full technical information contact the nearest Dow Corning office or write directly to Dept. 6508.



Paint based on new Dow Corning resin takes a 180° bend on a ¼" mandrel without crazing, checking, or peeling.

Panels exposed for one year in industrial location. Note how organic paint (right) has faded and chalked while silicone finish is unaffected.



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## *Progress Report:*

# WATER-TYPE INDUSTRIAL PAINTS

R. B. Drubel

E. J. Walsh

THE manufacturing and allied industries are hard task-masters to the paint industry. It is safe to assume that metal fabricators, finishers and parts producers never have been and never will be completely satisfied with the performance of industrial finishes-applied in the factory.

Ideally, they would like to eliminate the paint step entirely. This accounts for the research in metallizing and other metal surface treatment to prevent rust and corrosion. These methods are receiving more attention each year. In other instances, the decorative boon of a protective coating is imperative to the utility and success of the manufactured piece. Here, industry asks lower cost paint, more durable paint, paint with better adhesion, better color retention, paint with faster dry and lower bake, etc.

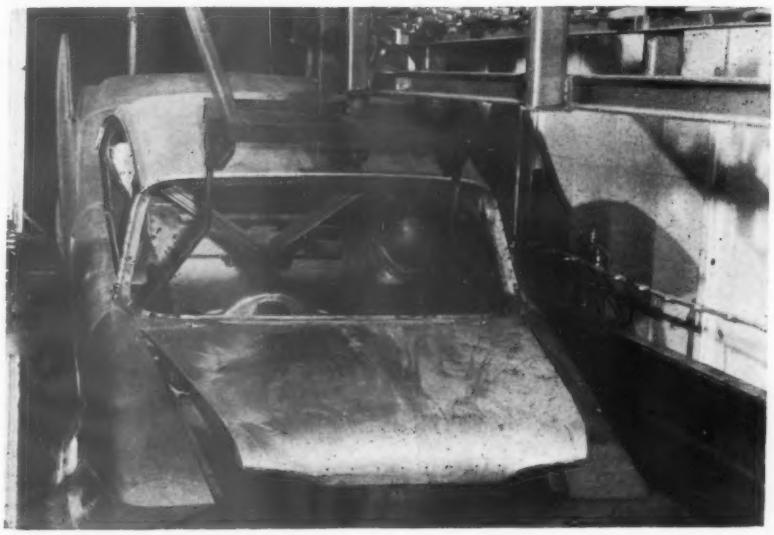
The drive and vitality shown by the metal finishing industry has been matched by the paint industry. Many different paint products have been designed to answer more specific metal finishing needs. Among the most promising are the water thinnable systems.

### Binders

The binders offered over the past four years for water thinned industrial paint systems include styrene-butadiene latexes, acrylic latexes, resin emulsions and water soluble resins.

All binder types thus far have exhibited both strong and weak points.

The thermosetting type styrene-butadiene latexes have enjoyed the best success in water thinned industrial finishes because of their excellent hardness, adhesion, water resistance and economy. Application and handling characteristics for spray applying have been their major deficiency. The thermosetting or very high molecular weight acrylic latexes have been chosen on the basis of their excellent exterior durability as the starting points for outdoor finish coats. Application characteristics are cited as their major deficiency. Resin emulsions have approached the film properties of their solvent-thinned cousins. Stability and film properties, which are yet deficient, should continue to improve. Water soluble resins



**The 1960 Plymouth unitized body is being dip-coated with a rust proofing paint based on styrene-butadiene latex.**

The authors are connected with the Dow Chemical Co., Coatings Technical Service.

closely resemble the application and handling characteristics of solvent systems. High cost, and questionable exterior durability are still deficiencies.

The various water thinnable binders have been competing for use in automotive primer surfacers, topcoats, and chassis primers. The research and development race between binder suppliers is well underway, and the supplier who first succeeds in over-coming the major deficiencies of his binder system, should reap considerable reward.

**Primer Surfacer**

Of the two largest potential uses, primer surfacers and topcoats, the primer surfacer application has received the most interest and must be considered the closest to actual production use. In this area, thermoset styrene-butadiene latexes show excellent durability on both panel and actual automobile exposures. Both handling characteristics and water resistance properties attained from accelerated tests are considered as deficiencies. Resin emulsion primer surfacers look good on exposure but also fall short in handling characteristics and water resistance. Water soluble resins show acceptable application and handling characteristics and their film properties in short term exposures look excellent.

**Topcoat**

In the field of automotive topcoats, acrylic type latexes have shown better durability than presently used finish coats. In-plant application and handling methods established for currently used enamel systems have presented a problem in the form of dry overspray with acrylic latex finishes. Because lacquer topcoat users buff after the finish coat is applied, dry overspray during application of paint is not overly critical to them. However, the oven facilities of these same lacquer users are limited to lower bakes than are required with most water-thinned finishes.

Water soluble resins have adequate application properties but require higher bakes and as yet have not shown adequate durability. Resin emulsion systems have not yet shown adequate durability for topcoat finishes. Styrene-butadiene systems in experimental topcoats chalk prematurely.

There is no present commercial use of either a water thinned automotive primer surfacer or topcoat despite the tremendous amount of effort expended by both the paint and automotive industries. Non-automotive uses, although somewhat less critical in property requirements, have received a lesser amount of interest and effort. Applications such as appliance finishes, drum coatings, tank car linings and air-dry finishes for metal parts, all have been investigated and show promise. While water thinned paints are still deficient in some properties, they are extremely close to equaling present day finishes in the major automotive uses.

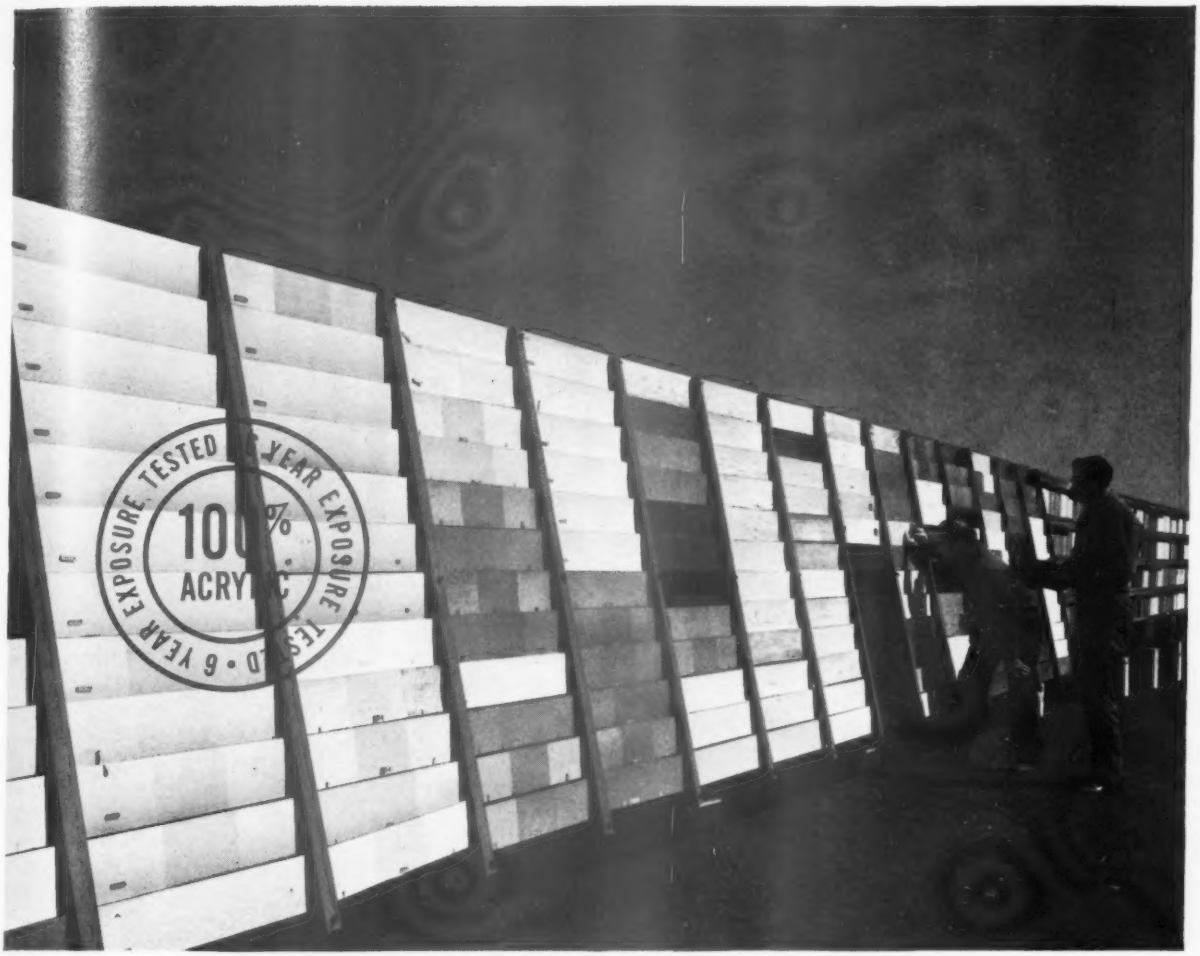
**In this dipping process, Ford Thunderbirds are run through underbody primer based on styrene-butadiene latex.**

**Chassis Primer**

Water thinnable automotive chassis dip primers containing styrene/butadiene latex have been very successful. In the fall of 1957 the Ford Motor Company started dipping the lower portion of Lincoln and Thunderbird cars. This application is now going into its third consecutive year of production, speaking well for the system's applicability. Last fall, the Chrysler Corporation commenced dipping the lower portion of the unitized bodies of Plymouth, Dodge, Dodge Dart, Desoto, Chrysler and Valiant cars in a water thinned primer. This year alone should see the production of over one million cars whose unitized bodies have been conditioned against corrosion by nearly 2,500,000 gallons of baked water thinned primer.

Since present day automotive finishing lines have been developed to their present high level of efficiency with a long use history of enamels and lacquers, drastic changes in application methods and apparatus to permit use of water thinnable paints will have to be accompanied by a very large incentive. Technology in water thinned automotive finishes to date has not indicated this tremendous incentive on the basis of film properties alone. Present plant layout and investment delay many uses for which water-thinned finishes are now suitable. However, as new finishing plants are built, as latex paint properties become even further improved, and as the need to reduce atmospheric contamination and fire hazard increases, incentive to use the water thinned systems will be ample.

The success of water thinnable industrial finishes suggests that before too long they will have a definite and growing portion of the metal finishing business. The research and development effort and money spent thus far as well as the field acceptance to date insures this. It appears that the automotive industry will be the first large scale end use for water thinnable metal finishes. Other uses will follow as the technology and popularity of these new finishes continue to grow.




*One of the test fences at the Rohm & Haas proving grounds near Philadelphia, Pa.*

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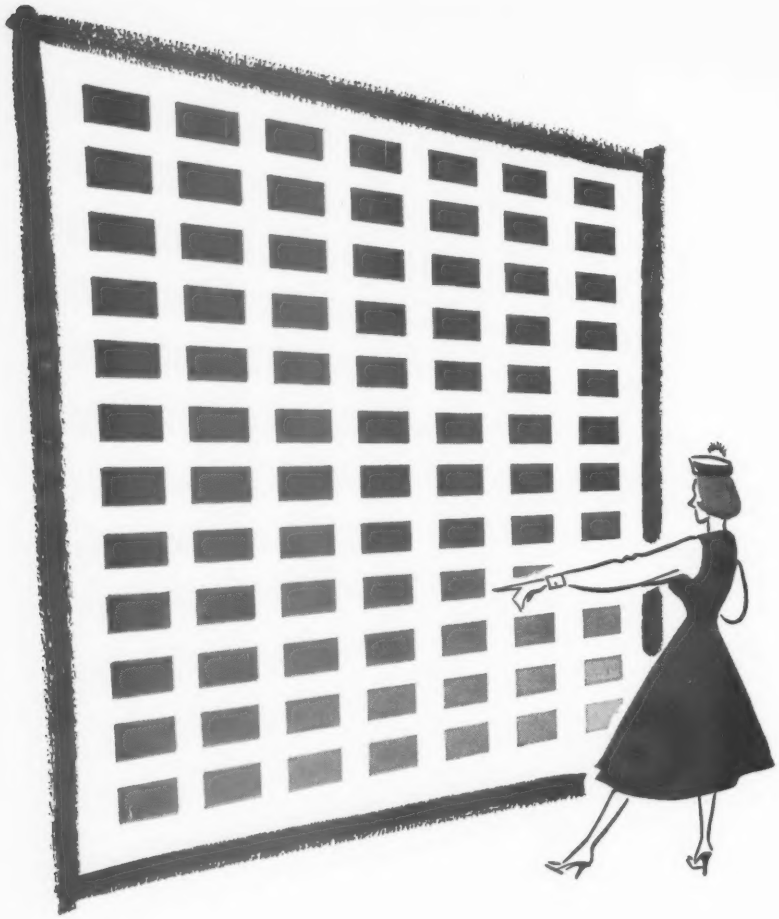

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*A New Approach To*

# TRIMETHYLOLPROPANE ALKYD RESINS

By

T. M. Powanda* J. F. Dash*
G. Wiech** J. A. Vona*

RECENT changes in the price structure of tall oil fatty acids (TOFA) have motivated the "economically aware" coatings chemist to incorporate this low priced acid in alkyd resins. Furthermore, the highly competitive market of the "Sixties" will necessitate the development of superior resins and enamels at lower prices. In order to achieve this delicate balance of low cost without sacrificing quality, intensive studies have been made on the preparation of Trimethylolpropane/TOFA alkyd resins and the enamels prepared from these resins. The object of this paper is to present some interesting data on this subject to stimulate development in more specific areas. Finally, a comparison will be made between trimethylolpropane, glycerine and trimethylolethane-TOFA alkyds and their corresponding enamels.

Since there is a particular interest in products of the bake type, product application was carried out in this area. In one series of reactions the excess hydroxyl was varied with a fixed TOFA/PA (phthalic anhydride) ratio; in a second series, the excess hydroxyl was kept constant and the TOFA/PA was varied. Finally, the effect of hydroxyl source variation was evaluated in equivalent formulations.

## Part I

### Effect of Excess Hydroxyl—TOFA/PA Ratio Constant

In Table I resins L, M and N represent 20, 25 and 30% excesses of hydroxyl respectively. These data indicate that there is an optimum excess of hydroxyl to meet a set of conditions—in this series the excess would be 25%. The reaction rate actually increased in going from 20 to 25%, and an acid number of 10 and a workable viscosity were obtained. Below 25% there was difficulty in getting the acid number down before excessive viscosity developed. With an excess of 30% the reaction time increased and the reaction had to be taken to a much lower acid number before the desired viscosity was obtained.

Evaluation of these vehicles in enamels shown in Table II brought out: a drop in hardness and an increase in reverse impact on increasing hydroxyl excess. Under the conditions of test all 3 films were unaffected by caustic in 8 hours or by boiling water in 6 hours. As far as resistance to overbake was concerned all films were qually good.

TABLE I

EFFECT OF EXCESS HYDROXYL TRIMETHYLOLPROPANE—TALL OIL FATTY ACIDS

| RESIN NUMBER | L | M | N |
|---|---|---|---|
| Material Charge | | | |
| Trimethylolpropane | 33.6 | 34.5 | 35.3 |
| Tall Oil Fatty Acids | 26.7 | 26.4 | 26.1 |
| Phthalic Anhydride | 39.6 | 39.1 | 38.5 |
| % Excess Hydroxyl | 20.0 | 25.0 | 30.0 |
| Reaction Temperature (°C) | 225/230 | 225/230 | 225/230 |
| Reaction Time (hours) | 5.75 | 5.40 | 7.10 |
| Physical Constants | | | |
| Acid Number (Solids) | 14.1 | 10.0 | 4.7 |
| Solids (%) | 60.0 | 60.5 | 60.6 |
| 60% Solution-Xylol | | | |
| Color (Gardner) | 4½ | 4½ | 4½ |
| Viscosity (Gardner) | >Z6 | >Z6 | >Z6 |
| Viscosity (Brookfield cps at 25°C) | 33,100 | 33,800 | 32,400 |

## Part II

### Effect of TOFA/PA Ratio—Excess Hydroxyl Constant

In Table III resins L, O, P and Q have progressively greater proportions of tall oil fatty acids. As might be expected, lower acid number and generally speaking, lower viscosity are obtained with increased TOFA.

The evaluation of these vehicles in enamels (Table IV) is very interesting, however, for it indicates definite correlation between TOFA/PA ratios and coating properties. All films showed excellent initial color and color retention, though on extended overbake differences did show up, the greater the tall oil fatty acid content the greater the degree of yellowing. All films were unaffected by a 6 hour immersion in boiling water. Alkali resistance for all films was excellent. To determine exactly how good the alkali resistance of these coatings was, the coating containing Resin Q was subjected to extended contact with 5% alkali. It took 260 hours before even a very slight etch was evident.

Another most interesting aspect of this evaluation shows up if hardness and reverse impact are plotted against TOFA/PA ratio. (Graph I). The hardness

*Application Laboratory, Product Development Dept., Celanese Chemical Co., Summit, N. J.
**Product Development Dept., Celanese Chemical Co., New York, N. Y.

TABLE II

ENAMEL EVALUATIONS
EFFECT OF EXCESS HYDROXYLS

| RESIN NUMBER | L | M | N |
|---|---|---|---|
| % Excess Hydroxyl | 20 | 25 | 30 |
| Sward Hardness | 56 | 56 | 48 |
| Resistance to 5% Alkali | No effect 8 hrs | No effect 8 hrs | No effect 8 hrs |
| Resistance Boiling Water (6 hrs.) | No effect | No effect | No effect |
| Impact—Pass/Fail (inch-pounds) | 4/8 | 8/12 | 20/24 |
| Resistance to Over-bake (300°F) | | | |
| Initial Gloss | 91 | 93 | 94 |
| Color | −.023 | −.006 | −.006 |
| 1 Hour Gloss | 89 | 90 | 91 |
| Color | .006 | .012 | .000 |
| 2 Hours Gloss | 90 | 91 | 93 |
| Color | .030 | .030 | .024 |
| 4 Hours Gloss | 85 | 87 | 90 |
| Color | .031 | .036 | .036 |

ENAMEL CONSTANTS
Pigment: Titanium Dioxide
Pigment/Vehicle Solids: 22/38
Alkyd/Melamine Solids: 80/20
Films baked 20 minutes at 300°F

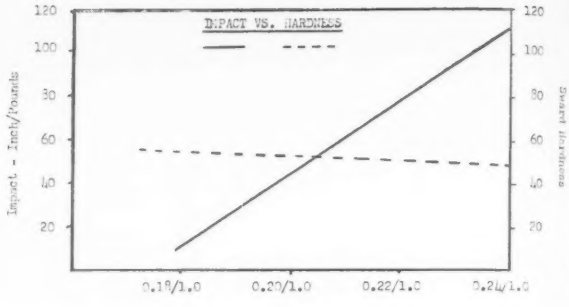
curve shows a relatively small change (8 Sward units) in going from .18/1.0 to .24/1.0 or from 39.6% PA to 35.6% PA. However, the effect on impact is amazing, going from 4 inch pounds to 112 inch pounds.

### Part III

### Effect Of Hydroxyl Source—TOFA Alkyds And Enamels

A series of alkyds was formulated wherein the TOFA/PA ratio was kept constant and the polyol was varied (Table V). By this approach it was possible to assay the effect of hydroxyl source on the physical and chemical properties of the vehicles and their enamels.

The most significant point derived from the data in Table V is the longer reaction times required by trimethylolpropane and trimethylolethane. It is possible that the longer reaction times are attributable to the type molecule being formed. Glycerine gives primarily a linear molecule. The initial reaction is with the terminal primary hydroxyls and with the excesses of hydroxyl used in these reactions, not many secondary hydroxyls enter into the reaction to give branching. Trimethylolpropane and trimethylolethane, on the other hand, have three primary hydroxyl groups all equally reactive. The resultant molecules are more symmetrical, tightly knit and branched. The reactions of these polyols, as a consequence, tend to be slower.




Graph I

Outstanding differences occur in enamel evaluations of these vehicles (Table VI). As previously noted the trimethylolpropane films exhibited unusual resistance to alkali. This property is even more marked when compared to the other triol-based systems. The unusual heat stability of trimethylolpropane materials is evident in comparing initial colors and colors on overbake. In contrast to comparison films the trimethylolpropane enamel was unaffected by 6 hour immersion in boiling water. Typically, the trimethylolpropane enamel had a lower weight per gallon than either of the other two enamels.

In Part II an unusual relation between hardness and impact resistance for the homologous series of trimethylolpropane/TOFA alkyd resins was illustrated (Graph I). The trimethylolethane and glycerine counterparts of Resin Q did not exhibit this striking feature. Both enamels were softer and had poorer impact resistance.

### Summary

Top quality coatings need not be excessively priced. A combination of trimethylolpropane and tall oil fatty acids is the answer. Coatings based on these materials give excellent color and color retention, hardness, resistance to alkali and boiling water and high impact resistance.

TABLE III

EFFECT OF TALL OIL FATTY ACID TO PHTHALIC RATIO
EXCESS HYDROXYL HELD CONSTANT

| RESIN NUMBER | L | O | P | Q |
|---|---|---|---|---|
| Material Charge | | | | |
| Trimethylolpropane | 33.6 | 33.03 | 32.44 | 31.86 |
| Tall Oil Fatty Acids | 26.7 | 28.73 | 30.67 | 32.54 |
| Phthalic Anhydride | 39.6 | 38.24 | 36.89 | 35.60 |
| % Excess Hydroxyl | 20.0 | 20.0 | 20.0 | 20.0 |
| TOFA/PA | 0.18/1.0 | 0.20/1.0 | 0.22/1.0 | 0.24/1.0 |
| Reaction Temperature (°C) | 225/230 | 225/230 | 225/230 | 225/230 |
| Reaction Time (hours) | 5.75 | 6.35 | 5.90 | 7.00 |
| Physical Constants | | | | |
| Acid Number (Solids) | 14.1 | 12.1 | 7.5 | 5.7 |
| Solids (%) | 60.0 | 60.5 | 60.7 | 60.5 |
| 60% Solution-Xylol | | | | |
| Color (Gardner) | 4½ | 4½ | 4¾ | 4¾ |
| Viscosity (Gardner) | >Z6 | Z 3¾ | >Z6 | Z 5¾ |
| Viscosity (Brookfield cps at 25°C) | 33,100 | 8,700 | 19,000 | 17,000 |

## TABLE IV

### ENAMEL EVALUATIONS
### EFFECT OF TALL OIL FATTY ACIDS TO PHTHALIC RATIO
### TRIMETHYLOLPROPANE ALKYDS

| RESIN NUMBER | L | O | P | Q |
|---|---|---|---|---|
| %Excess Hydroxyl | 20.0 | 20.0 | 20.0 | 20.0 |
| TOFA/PA | .18/1.0 | .20/1.0 | .22/1.0 | .24/1.0 |
| Sward Hardness | 56 | 52 | 50 | 48 |
| Resistance to 5% Alkali | No effect 8 hrs | No effect 8 hrs | No effect 8 hrs | V.S1.Etc 260 hrs |
| Resistance Boiling Water (6 hrs) | No effect | No effect | No effect | No effect |
| Impact-Pass/Fail (Inch-Pounds) | 4/8 | 44/48 | 88/100 | 112/118 |
| Resistance to Overbake (300°F) | | | | |
| Initial Gloss | 91 | 90 | 92 | 96 |
| Color | −.023 | −.018 | −.017 | .000 |
| 1 Hour Gloss | 89 | 89 | 92 | 95 |
| Color | .006 | .006 | .012 | .024 |
| 2 Hours Gloss | 90 | 89 | 92 | 95 |
| Color | .030 | .024 | .035 | .035 |
| 4 Hours Gloss | 85 | 87 | 90 | 94 |
| Color | .031 | .042 | .048 | .060 |

**ENAMEL CONSTANTS**
Pigment: Titanium Dioxide
Pigment/Vehicle Solids: 22/38
Alkyd/Melamine Solids: 80/20
Films baked 20 minutes at 300°F

## TABLE V

### EFFECT OF THE HYDROXYL SOURCE ON THE PROPERTIES OF TOFA ALKYDS

| RESIN NUMBER | Resin Q | | 4589-2 | | 4589-15 | |
|---|---|---|---|---|---|---|
| Material Charge | Equiv. | Wt.% | Equiv. | Wt.% | Equiv. | Wt.% |
| Trimethylolpropane | 1.20 | 31.86 | — | — | — | — |
| Trimethylolethane | — | — | 1.20 | 29.93 | — | — |
| Glycerine | — | — | — | — | 1.20 | 24.88 |
| Tall Oil Fatty Acids | 0.197 | 32.54 | 0.197 | 33.46 | 0.197 | 35.87 |
| Phthalic Anhydride | 0.803 | 35.60 | 0.803 | 36.61 | 0.803 | 39.25 |
| % Excess Hydroxyl | 20 | | 20 | | 20 | |
| Reaction Temperature (°C) | 225/230 | | 225/230 | | 225/230 | |
| Reaction Time (hours) | 7 | | 5.5 | | 2.75 | |
| **Physical Constants** | | | | | | |
| Acid Number (Solids) | 5.7 | | 6.5 | | 6.8 | |
| Solids (%) | 60.5 | | 60.2 | | 60 | |
| 60% Solution-Xylol | | | | | | |
| Color (Gardner) | 4¾ | | 5½ | | 5½ | |
| Viscosity (Gardner) | Z 5¾ | | Z 5¼ | | >Z6 | |
| Viscosity (Brookfield cps at 25°C) | 17,000 | | 12,200 | | 46,800 | |

## TABLE VI

### ENAMEL EVALUATIONS
### EFFECT OF THE HYDROXYL SOURCE ON ENAMEL PROPERTIES

| RESIN NUMBER | Resin Q | 4589-2 | 4589-15 |
|---|---|---|---|
| Hydroxyl Source | Trimethylolpropane | Trimethylolethane | Glycerine |
| % Excess Hydroxyl | 20 | 20 | 20 |
| Sward Hardness | 48 | 44 | 42 |
| Resistance to 5% Alkali (hrs to etch) | 260 | 90 | 5 |
| Resistance to Boiling Water (6 hrs.) | No effect | Fine Blisters Dulling of Film | Fine Blisters Dulling of Film |
| Impact—Pass/Fail (Inch-Pounds) | 112/118 | 28/32 | 60/64 |
| Conical Mandrel | No effect | No effect | No effect |
| Resistance to Overbake (300°F) | | | |
| Initial Gloss | 96 | 97 | 98 |
| Color | .000 | .011 | .028 |
| 4 Hour Gloss | 94 | 89 | 93 |
| Color | .060 | .087 | .138 |
| Weight/Gallon (21 sec. #4 Ford Cup) | 8.94 | 9.13 | 9.25 |

**ENAMEL CONSTANTS**
Pigment: Titanium Dioxide
Pigment/Vehicle Solids: 22/38
Alkyd/Melamine Solids: 80/20
Films baked 20 minutes at 300°F

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## Micro Fine Precipitated Silicas...

**Quso F 20**

**Quso G 30**

Now, soft white silicas of micro fine particles sized from 9 to 15 millimicrons are produced by our unique process (patent applied for). Two different varieties available are Quso F 20, nearly neutral, (pH 6.4) and Quso G 30 which is slightly alkaline, (pH 8.2). Each silica has a high surface area of about 280 square meters per gram.

Outstanding features of Quso F 20 in nitrocellulose lacquers are high flatting efficiency, excellent suspension, good resistance to overgrinding. Lacquers using Quso F 20 produce films at any gloss level, that are smooth and transparent with a warm "rubbed effect" appearance, combined with a sleek feel.

Quso G 30 is especially interesting to manufacturers of air dry alkyd and alkyd urea acid catalyst systems, because of its alkaline nature, pH 8.2.

Price per Pound f.o.b. Chester, Pa.

Trademarks Reg. U.S. Pat. Off.

| Product | Truckload and Over | Less Than Truckload | | | |
|---|---|---|---|---|---|
| | Minimum 10,000 lbs. | 1000-9975 lbs. | 600-975 lbs. | 200-575 lbs. | 25-175 lbs. |
| Quso F 20 | $.55 | $.60 | $.65 | $.70 | $1.35 |
| Quso G 30 | .55 | .60 | .65 | .70 | 1.35 |

Package—Multiwall paper bag; 25 lbs. net.

Samples, further information and technical assistance will be furnished promptly on request.

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# ORGANIC FINISHES MODIFIED WITH SILICONE RESINS

***Finishes capable of withstanding high temperatures can be formulated at reasonable costs by using blends of conventional paint vehicles with special silicone resins.***

A NEW development in the military paint field is an olive-drab finish for truck and tractor mufflers and manifolds which also has potential civilian uses, as for example, on exhausts of power lawn mowers.

The finish is a conventional organic paint modified with a new silicone resin developed by Union Carbide Corporation. It will protect exhaust pipes up to 500°F.

Previously this was the situation:

1. The armed forces needed better high temperature paints for the mufflers and manifolds of their tanks, tractors, trucks, and other mobile equipment.
2. The conventional organic paints could not withstand temperatures over 300-350°F. Existing finishes compounded with a mixture of organic and silicone resins were useful at temperatures up to 400°F. This was not enough.
3. The straight silicones could do the job, but they were too expensive.

How then, could the need for an effective high temperature finish be met at a reasonable cost?

A practical and economic solution was worked out. The laboratories of Silicones Division, Union Carbide Corporation, at Tonawanda, N. Y., have developed a new silicone resin which offers substantial savings because of its effectiveness at relatively low concentration. In other words, it can be blended with organic materials and still withstand elevated temperatures.

Adoption of a finish based on this new material—now available commercially as "Union Carbide" XR-630 Silicone Resin—does the job. Considerable field testing, on the West Coast as well as in the Tonawanda region, and on both sides of the Canadian border, preceeded the release of XR-630. Coatings made with it not only resist high temperatures caused by the exhaust gases, but are impervious to their corrosive attack and to water attack, and can also be used under the extremes of climate and weather conditions which prevail in the many parts of the world where United States Armed Forces now operate.

The resin when blended with

(*Turn to page 88*)

One large use of high temperature paints is cn jet engines.

# NEW HALF SECOND BUTYRATE/RESIN COMBINATIONS PRODUCE SUPERIOR COATINGS

Half-Second Butyrate has become widely accepted among lacquer formulators as a major film-forming material. Coatings based on it are noted for their low color, non-yellowing characteristics, toughness, flexibility, outdoor durability and high gloss.

Now even greater advantage can be taken of these properties. For recent work has shown that a number of important resins not generally considered in the formulation of Butyrate coatings can in fact be combined with Half-Second Butyrate to produce finishes of outstanding performance.

In many of these finishes, Half-Second Butyrate serves as a modifying resin; in others, it is the basic film-former. In either case, the combination results in coatings whose properties are significantly superior to those obtainable from either resin alone.

The characteristics of a number of these combinations are described here.

**HSB/Amino** *Amino* resins modified with Half-Second Butyrate produce lacquers of increased toughness, improved sprayability and flow-out, more rapid air-dry and outstanding weather resistance. Half-Second Butyrate modified with amino resins, on the other hand, offers improved adhesion and abrasion resistance, and increased heat and solvent resistance. In both cases, the amino resins crosslink with the hydroxyl groups on the cellulose acetate butyrate molecule.

**HSB/Epoxy** *Epoxy* resins of low molecular weight are used to modify Half-Second Butyrate to produce coatings with improved adhesion. In epoxy-butyrate-amino formulations, the epoxy resin acts to stabilize the system, increasing its storage stability significantly. Such formulations exhibit great toughness and flexibility.

**HSB/Polyurethane** *Polyurethane* systems show improved build and better flow characteristics with the addition of a Butyrate resin such as EAB-381-20. This resin has a higher viscosity than has Half-Second Butyrate.

**HSB/Silicone** *Silicone* resins, when added to Half-Second Butyrate formulations, further improve their outdoor durability and high gloss retention characteristics.

**HSB/Acrylic** *Acrylic* resins, in combination with Half-Second Butyrate, show improved film performance in several ways over formulations based on acrylics alone. Use of Half-Second Butyrate builds solids content, improves sprayability, and imparts better solvent release characteristics. In addition, the coating is tougher and shows better weather resistance and gloss retention. The excellent adhesion and alkali resistance of Butyrate-acrylic formulations suggests their use on exterior structural aluminum.

**HSB/Maleated vinyl** *Maleated vinyl* resins may be used—and only relatively small amounts are required—to improve the initial toughness and adhesion of Butyrate-acrylic films.

**HSB/Oil-free alkyds** *Oil-free alkyds*, when incorporated in Half-Second Butyrate formulations, serve to improve adhesion and toughness.

**HSB/Polyester** *Polyester* resins can be modified with up to 15% Half-Second Butyrate. The addition of Butyrate resins promotes leveling and brings about a sharp reduction in tack-free time.

The results of these studies of Butyrate/Resin combinations are discussed in detail in Eastman's **"Formulator's Notes 0.3."** Starting formulations are included. Write or call the nearest Eastman sales office for your copy.

**HALF SECOND BUTYRATE**
**an Eastman film-former**

**SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Massachusetts; Greensboro, North Carolina; Houston; New York City; Philadelphia; St. Louis.**
**West Coast: Wilson & Geo. Meyer & Company, San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.**

By
**Edward Anthony**

**The author expresses his random reflections on various aspects of the paint industry. The opinions contained in this column are his alone and do not necessarily reflect those of this publication.**

### History Lesson

THE past few decades have seen the introduction of more new methods of applying coatings than had been developed during the preceding umpty-thousand years since those first finger paintings by some unknown caveman of the Ice Age. Of course, one's own children often seem to be throw-backs to that bygone era—referring to finger painting, naturally!

In the fine (and cosmetic) arts the brush remains king; however the finishing of furniture, farm implements and homes—the three main uses of paint on the eve of the industrial revolution—has undergone violent evolutionary changes. The commercialization of modern utilitarian goods, contained in fabricated metal housings which need both protective and decorative coatings, opened undreamed-of vistas for the usage of paint. These production line products—whose number reach into millions of units per year—emphasize why the brush has been replaced in varying degrees by the spray gun, dip tank and roller coater.

Of very recent development are various *coaters*—flow, knife, direct roller, reverse roller, curtain—all particularly adapted to finishing of the flat, uncomplicated shapes so prevalent in today's designs.

The first commercially manufactured spraying device, a medical atomizer, was made in 1909 by the DeVilbiss Co. ("Famous First Facts" by J. N. Kane). Employment of the same principle, combined with compressed air, started a revolution in the application of organic coatings.

The development of the aerosol, a pressurized container dispensing system, has shown that spraying as an application method can go in other guises. According to the Chemical Specialties Manufacturers Association approximately ten per cent of the 500 million aerosol units produced in 1959 contained coatings and finishes.

The advent of two-component, catalyzed resin systems has posed finishing problems for which special spray apparatus has been developed to keep pace with this latest advance in formulative technology.

But what about the "olden times?" Actually very little basic improvement has been made in the paint brush for four thousand years. The earliest crude brush, made possibly with reeds, was supplanted by a bunch of bristles tied to a stick. Then the brush developed rapidly, and amazingly, judging by the proficiency of the Egyptians and Greeks.

One of the first known types of brushes is the *besom*, a bundle of twigs or brushwood tied to a wooden handle by means of cane, from which developed the *cornbroom* and *whisk*. In fact, the derivation of the word is from the Old French *broce*, meaning brushwood. A *broom* may be considered to be a brush with a long handle.

The first manufactured brushes in this country were made in Medfield, Mass., in 1808, by Artemus Woodward. The most popularly used type of bristle for the stiffer paint and art brushes is the *French bristle*. These are pulled from the hogs of Central Europe. Other sources of popular bristle types are Russia and China. And the famed *camel's hair* brush goes under false colors, for the commercial material that is generally known as camel's hair is taken from a species of squirrel that is an inhabitant of cold countries, like Siberia. Of course, the recently developed synthetic fibers have captured a considerable portion of today's market.

The brush has been supplanted in many fields by the numerous and varied newer methods of applying paint. So also it is being succeeded in that last stronghold, the cosmetic arts. Have you noticed your wife putting on the oh-so-fashionable eye make-up with one of those miniature rollers?

### Applying the Lesson

ONE of the most rapidly evolving developments in the huge construction industry is the use of pre-finished paneling for interior walls, and pre-finished aluminum, wood and composition board siding for exteriors. This has been made possible by modern high speed application methods.

Of the over 30 billions of board feet of lumber cut each year it is said that almost one-quarter of this vast production must be utilized from the waste resulting from the first, prime use—for obvious economic reasons. Much of this, combined with various resinous binders by heat and/or pressure, takes many forms under the general classifications of hardboard and particle board.

The upgrading of these boards for use as furniture and cabinet components, shelving, paneling, and building construction material, can further open a large new market for finishes which to date has hardly been tapped. The Hardboard Association, Chicago, predicts hard-

board output of almost two billion square feet during 1960 (10 per cent higher than in 1959), and that the 1970 figure will be double! If only 25 per cent of this year's production is pre-finished, consumption of paint would approximate one million gallons.

Add to this the increasing proportion of the plywood veneer production that is being pre-finished and the tremendous footage of inexpensive imported veneer that is being upgraded by finishing, and some idea begins to take form of the vastness of the current and potential use of finishes involved in the lumber industry.

However, just as vinyl-clad steel has bitten into paint use in the finishing of appliances, laminates of vinyl, polyester and other free-films will be challenging for this huge market. Vigorous promotion of this finishing technique has already begun. The continuing development of superior finishes (particularly the catalyzed types: polyesters, epoxies, urethanes, alkydureas), the increasing use of automated production equipment, and emphasis on the cost advantages (as great as ten-fold!)—these are the ways to go after this business.

Design reproduction by offset printing techniques is another upgrading method which greatly enhances the value of these low cost substrates. First used on a large scale by the radio and television cabinet manufacturers about ten years ago, after almost two decades of development and some industrial success, tens of millions of square feet of interior hardboard and inexpensive wood paneling are currently being produced. The priming color coat and protective topcoat—usually applied by low cost, high production methods (roller coater, curtain coater, etc.)—are exceptionally large volume targets.

This is a typical example of new markets which the paint industry must capture by creative finishing development—from new application methods for the customer and reaching all the way back to new resins in the finish.

**Progress**

BY the time you read this, Los Angeles will have finished hosting the Democratic National Convention. This event—together with the advent of Big League baseball three years ago!—marks a long upward step for the civic pride of the heart city of the Southland. This rapidly growing area—the median line for California's burgeoning second place population is in the San Fernando Valley, about 15 miles north of the L. A. Civic Center—has bounced into a tie with Chicago as the second largest population and marketing area in the country, according to preliminary figures gathered by this year's census.

The growth of the paint industry in this area reflects the vigorous increase that all industry has undergone to keep pace with the needs of the hordes of newcomers who daily swell the population figures. All of the major uses of coatings—homes, general construction, furniture, automobiles, appliances, etc.—have set new production records yearly. The latest figures of the Federation of Societies for Paint Technology show that about 240 technical people, representing 120 paint manufacturing companies and suppliers, are members—an 80 per cent increase over the '50 figures. There are now four societies in the Far West—Los Angeles, San Francisco, Pacific Northwest, Rocky Mountain—representing 13 per cent of the 3900-member organization.

The war-derived expansion impetus continues almost unabaited in Southern California fifteen years later. Virtually every major item of commerce (and convenience) is now manufactured in this area—a statement that certainly was not true just before World War II—and those that aren't (such as, washing machines) soon will be. Unfortunately for our industry, the major industry of the Southland, aircraft and missles, uses relatively little in the way of organic coatings. On the brighter side is the fact that it is the Number One market for automobiles and ranks second in construction (to the New York City metropolitan area)—both large consumers of paint.

With pride rivaling the fabled braggadocio of the Texans, Southlanders are pushing for Number One in everything, and the paint industry is being carried along on a tidal wave of optimism and real progress.

**Dollars and Sense**

THE National Science Foundation, as part of its responsibility for maintaining the National Register of Scientific and Technical Personnel, is distributing questionaires to over 100,000 chemists, in cooperation with the American Chemical Society, to obtain background information on training, employment, experience, salary, etc. The last comprehensive salary survey of chemists was conducted by the Society in 1955. For comparative purposes here are some interesting facts uncovered five years ago. At that time the median monthly remuneration, disregarding experience, was $639 for chemists employed in the paint industry (13th in rank of 33 types of employment) and $700 for chemical engineers (10th of 33).

Starting salaries were in the $400 per month bracket. After four years experience, the median monthly salary for all chemists had advanced to $490, for those in the paint industry to $451 (there were not enough chemical engineers at this level for meaningful comparative statistics). After eight years median remuneration had pushed up to $556 for all chemists and $616 for chemical engineers, and in the paint category to $518 and $600, respectively. After an individual had 15 years of experience comparable figures were $710 and $773 for all technical people, and $682 and $663 within the paint industry.

The results of the new survey, which will also include all of the other scientific and engineering disciplines, will certainly be of great interest. In what may be regarded as a preliminary report, the N. S. F. has released a "salary profile" on the total of 137,000 registrants who had provided salary information to the National Register for the three years '56-'58 (*Scientific Manpower Bulletin*, April, 1960).

The median annual salary for all of the scientists was $7900; for the 35,000 chemists, $8660; for the 4800 chemical engineers, $10,430 (the highest paid field except for those engaged in the medical sciences). At the low end of the scale were the 9500 respondents engaged in the agricultural sciences, $6625.

## Highest toluene dilution ratio

## with National® NADONE®

### (CYCLOHEXANONE)

One of the most powerful solvents available at a volume-production price, NADONE Cyclohexanone can cut the overall cost of solvent systems for organic coatings.

The addition of a small percentage of NADONE permits an increase in the volume of diluent that can be successfully incorporated in the solvent system. In nitrocellulose lacquers, for instance, NADONE solutions have a 6.3 toluene dilution ratio. Comparably high ratios obtain for other resins and diluents.

Conversely, NADONE solvent power makes possible higher solids content in resin-solution formulations.

An added advantage: Inclusion of NADONE prevents separation of resins and oils in solution and during evaporation of solvent from the film.

*U.S. Patent 2,389,608

**Other interesting, cost-saving uses of NADONE are:**

- As a detergent-additive in lube oils to minimize carbon and sludge formation.*
- To improve fractional solvent extractions.
- As a degreasing solvent or fortifier for lower-power degreasers.
- To make better paint removers, inks, adhesives, pesticides, etc., etc.

**WRITE FOR TECHNICAL BULLETIN I-19 F**

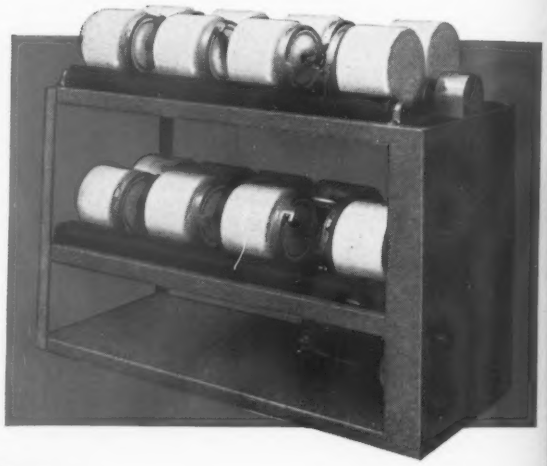
This 32-page bulletin gives details on these and other applications of NADONE, contains complete properties, reactions and a valuable list of 148 literature references. We'll gladly send you a copy of this bulletin and, if you wish, a liberal working sample of NADONE for your investigations.

**NATIONAL ANILINE DIVISION**
40 RECTOR STREET, NEW YORK 6, N. Y.
Atlanta Boston Charlotte Chicago Greensboro Los Angeles
Philadelphia Portland, Ore. Providence San Francisco
In Canada: ALLIED CHEMICAL CANADA, LTD., 100 North Queen St., Toronto 18
Distributors throughout the world. For information:
ALLIED CHEMICAL INTERNATIONAL • 40 Rector St., New York 6, N. Y.

Allied Chemical

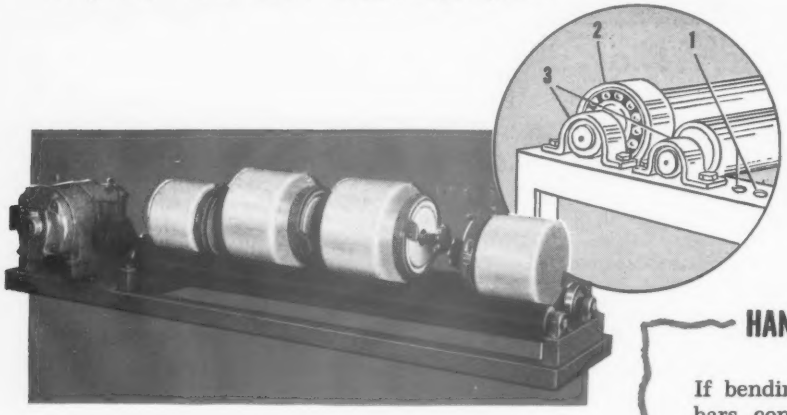
Greater Capacity
Maximum Flexibility
in LIMITED SPACE

# "U. S." LONG-ROLL JAR MILLS



"U. S." Long-Roll Jar Mills are specially engineered to make most efficient use of valuable floor space. Their greater capacity and flexibility make it possible to expand substantially your milling facilities within virtually the same floor area as occupied by other models.

These units have sturdy welded steel frames built for long, dependable service under rigorous operating conditions. The 3″ diameter parallel-ground rollers are made of long-wearing chemical- and solvent-resistant Neoprene rubber. Electrically conductive rubber automatically grounds any static charge generated by jar rotation. Heavy-duty motors and drives assure ample power.




### *Special features:*

1. **3-position adjustment handles jars 2″ to 15″ in diameter.**
2. **Free-turning, ball bearing jar stops.**
3. **Lifetime lubricated and sealed bearings.**

### *FULL RANGE OF SIZES*

Available with two or three rolls; single or multiple tiers; roll lengths from 16″ to 72″. Constant or variable speed drives. Wide choice of optional equipment including cabinets, casters, automatic timers, tachometers, clutches and drives.

### HANDY HINTS on Jar Milling

If bending or breaking jar lid locking bars constitute a problem, check for hardening of the gaskets. Should be soft enough to indent with fingernail (about 30 Durometer).

For additional helpful grinding and mixing data plus full details on "U. S." Jar Mills WRITE FOR BULLETIN JM-290.

*PROCESS EQUIPMENT DIVISION*

105-F3

**U. S. STONEWARE**

**AKRON 9, OHIO**

jars

stops.

d

# PRODUCTION

PACKAGING

MATERIAL HANDLING

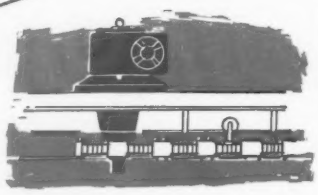
NEW EQUIPMENT and MATERIALS

Using steel shelving, M. A. Bruder and Sons, Inc., needs only one-fourth the warehouse space formerly needed to store paints in stacks of cases. This frees valuable space to store fast-moving paints and eases serious congestion caused by a 20 percent increase in business. For details, see page 59.

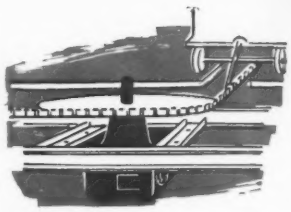
# *FAST off-the-shelf delivery*

# MORSE EBERHARDT-DENVER CONVEYOR DRIVES

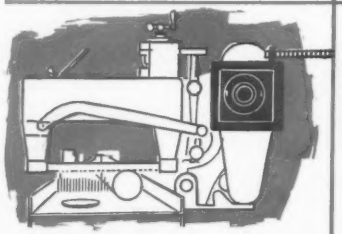
★ **No design limitation . . . up, down, or 90° mounting ★ one-piece alloy cast iron housing ★ high torque capacity ★ single or double reduction gears ★ input ratings from .12 hp to 53.72 hp using double worm reduction or helical worm reduction ★ ratios from 5:1 up to 3600:1—from stock at low factory prices.**



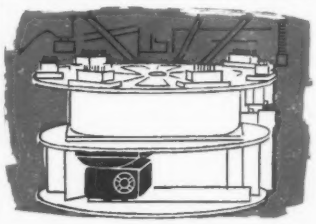
**OVERHEAD** . . . typical caterpillar or sprocket drives



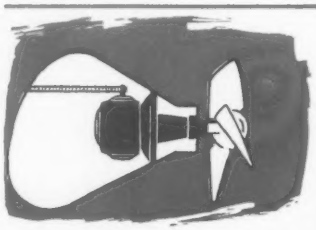
**SUB-FLOOR** . . . for towline or special equipment



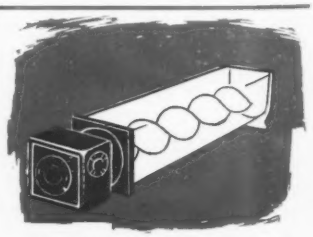
**90° MOUNTING** . . . for heavy-duty metal saws and machines



**VERTICAL** . . . base mounting for power turntable machines



**SIDE MOUNTED** . . . paint, pulp, liquid, or chemical agitators



**HORIZONTAL** . . . screw conveyors, straight or angular mounts . . . and scores of standard or special uses.

## Easy-mount design . . . only 4 bolts

Morse E-D speed reducers lead in limitless applications with utmost ease in mounting. The 4 holes form a perfect square concentric to the output shaft. Unlike most designs, Morse E-D speed reducers feature oversize bearings on wide centers . . . resulting in an overhung load capacity at the end of the output shaft equal to the torque capacity.

Mounting versatility with the unit's cast-in base makes Morse drives adaptable to conveyors of all types, agitators, screw conveyors, machines, and for any other transmission of power where dependable speed reduction is specified.

You'll find Morse "standard" drives ready for immediate delivery . . . often eliminate the problems of "specials." Check with your Morse distributor, he's listed in the Yellow Pages under "Power Transmission," or write Morse Chain Company, Dept. 43 80, Ithaca, N. Y. for illustrated catalogs. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ontario.

**MORSE** BW T.M.

A BORG-WARNER INDUSTRY

## *how to cope with*

# ABSENTEEISM

By
Lawrence Shatkin

ABSENTEEISM is a problem confronting many firms. Increased absenteeism occurs during labor shortages and during periods of economic growth and prosperity. This has been the case during the past decade, and efforts to reverse this trend have not been intensive, if available literature in this area is to be used as a criteria. Perhaps absenteeism has been considered as a statistic, in which those at one extreme are exceptional in attendance, while those at the other end come under fire. I think absenteeism has to be considered in the same manner as accident prevention, safety, and alcoholism. Absenteeism could very well be a human relations problem. Interesting research in this field has been done at the *Survey Research Center of Michigan University*. Social scientists are supplying industry and managers with vital information of individual and group behavior in the factory.

### Job Satisfaction

In general, there is an inverse relation between job satisfaction in the work situation and absence rates. This seems to apply to men in unskilled jobs, both in the office and factory, rather than those working in higher level jobs. An interesting survey conducted by the National Retail Merchants Association covering eight morale factors are shown in Table I.

The challenge to management is to motivate the worker to build up a latent source of energy that will overcome borderline incidents, which will swing the pendulum in the direction of having an individual go to work. The supervisor or foreman is in a pivotal position to direct such a program.

The supervisor should build an unbeatable team spirit in which the men get along well, are treated fairly, encouraged to think, kept abreast of company policies and plans, and told how they are performing periodically. He must be the type of leader who takes a personal interest in the man, and his job performance. He should be interested in encouraging the development of the individual.

### Factors Affecting Absenteeism

There is a direct relationship between absences and attitudes for

| Morale Item | Employee Ranking | Employer Ranking |
|---|---|---|
| Credit and recognition | 1 | 7 |
| Interesting work | 2 | 3 |
| Fair Pay | 3 | 1 |
| Understanding and appreciation | 4 | 5 |
| Counsel on personal problems | 5 | 8 |
| Promotion on merit | 6 | 4 |
| Good physical working conditions | 7 | 6 |
| Job Security | 8 | 2 |

**Table I. Survey of morale factors.**

The opinions expressed in this feature are not necessarily those of any particular firm or organization.

**Jobs involving repetitive duties should be analyzed periodically.**

men in the lower skilled jobs. However, this did not apply to women. It was definitely established that women's absence rates are higher than men's in every research study conducted.

The larger work group is more susceptible to increased absences than the smaller work group. Perhaps the feeling of belongingness and degree of participation are dissipated as you exceed a certain size. It is probably related to the concept of the span of control in which a supervisor has effective control and coordination over a certain sized group. Beyond a point, he loses his effectiveness, which is manifested in lower morale, increased absenteeism, and higher operating costs.

Management is in a position to ameliorate this condition through planning, selection and training of personnel. A re-evaluation of one's own activities is necessary since it has been established that size of department and quality of supervision are determinants of the degree of absences. These factors are controlled by management and they are in a position to re-consider this problem.

**New Hypothesis**

There are a group of scientists who have associated employee absences with the concept of accident-proness. Employee absence takes on the aspect of an individual function, rather than a cause and effect relation between the company and employee. Even if this be the case, it can still be classified as a human relations problem which management must face.

**Reducing Absenteeism**

The emotional appeal can have an effect depending upon domestic and world conditions. During World War II, a statement of Woodrow Wilson was quoted in several company and union brochures. It read, "To the miner let me say that he stands where the farmer does; the work of the world wants on him. If he slacks or fails, armies and statesmen are helpless. He also is enlisted in the great service army." In a somewhat similar vein, company survival is dependent upon customer service.

The employee magazine, posters, cartoons, and billboards are of some use in combating absenteeism. However, a discussion between top management and a shop committee is a more direct approach. Management must present its story dramatically and factually. High absenteeism gives the competitor an advantage because such a condition increases operating costs, lowers efficiency, drecreases production, and interrupts customer service. Any loss of business is detrimental to the company and its employees. The re-shuffling of crews and the inconvenience of many individuals becomes necessary in order to meet promised delivery dates. After all, the customer is not interested in excuses, but service.

Industrial relation executives are interested in this problem, and have made efforts to have clauses injected in collective bargaining agreements which provide for dismissal where absence is without notice or company approval. Many companies have provisions which stipulate loss of holiday pay if an employee is absent both the day before and after the holiday. Union representatives should be approached to admonish chronic absentees.

**Policy and Plan**

Every company should have some policy concerning absenteeism. Accurate records should be kept and examined periodically, and disciplinary action should take a definite form. It is recommended that warnings be written rather than verbal, and become part of the employee's personnel record. A review of arbitration cases in this field should prove helpful. Causes of absences should be studied, and suggestions for reducing absences should be welcomed.

**Summary**

1. It is estimated that absenteeism costs 1.5 per cent to 4 per cent of the total payroll.
2. Favorable work situations tend to reduce absence rates.
3. Employees with longer service usually have better attendance records.
4. People in repetitive jobs tend to be absent more frequently than those with a more interesting job.
5. Women have higher absence rates than men.
6. Larger work groups showed higher absence rates.
7. The quality of supervision is significant in influencing the rate of absenteeism.
8. Absenteeism is to some extent a human relations problem.

**Plant manager is in pivotal position to develop job satisfaction among workers.**

# BOOSTING WAREHOUSE SPACE WITHOUT NEW CONSTRUCTION

***What do you do when your warehouse fills up? Special steel shelving can help solve your problem.***

M. A. Bruder and Sons, Inc., a 62 year old Philadelphia firm had introduced many new paint formulations with additional colors to meet public demand. The need for a larger selection of paints and finishes had become apparent, especially for quick-drying and special-purpose products. Some of the firm's new formulations were: Minit-Dri, an all-purpose enamel; Acra-Lux Exterior Coating; and Party Room Paint, designed to turn interior basement areas into attractive family rooms.

Demand for these modern finishes was a mixed blessing, though, for the company was faced with a shortage of warehouse storage space. More room was needed immediately, but before planning new construction M. A. Bruder and Sons, Inc. took a second look at their existing storage methods. Paints were stacked in lots 15-ft high on the warehouse floor. As warehouse space became tighter, fast efficient handling also became a problem.

**Warehouse Bottleneck Eliminated**

M. A. Bruder and Sons, Inc. solved their storage problem by installing 60 units of adjustable steel shelving (900 lineal feet) the entire length of one wall of the warehouse. This shelving, supplied by Penco Div., Alan Wood Steel Co., provides 400% more storage space per square foot than did the old method. What's more, stock handling has been improved and order picking is easier and faster.

The paint firm wanted to complete the installation in as short a time as possible without interrupting the handling of orders. This was no problem with Penco-T-Line shelving which doesn't require the use of nuts, bolts, and tools. Instead, a simple steel channel clip is used. This clip locks into prepunched holes in the shelving "T-posts" and firmly supports the shelves.

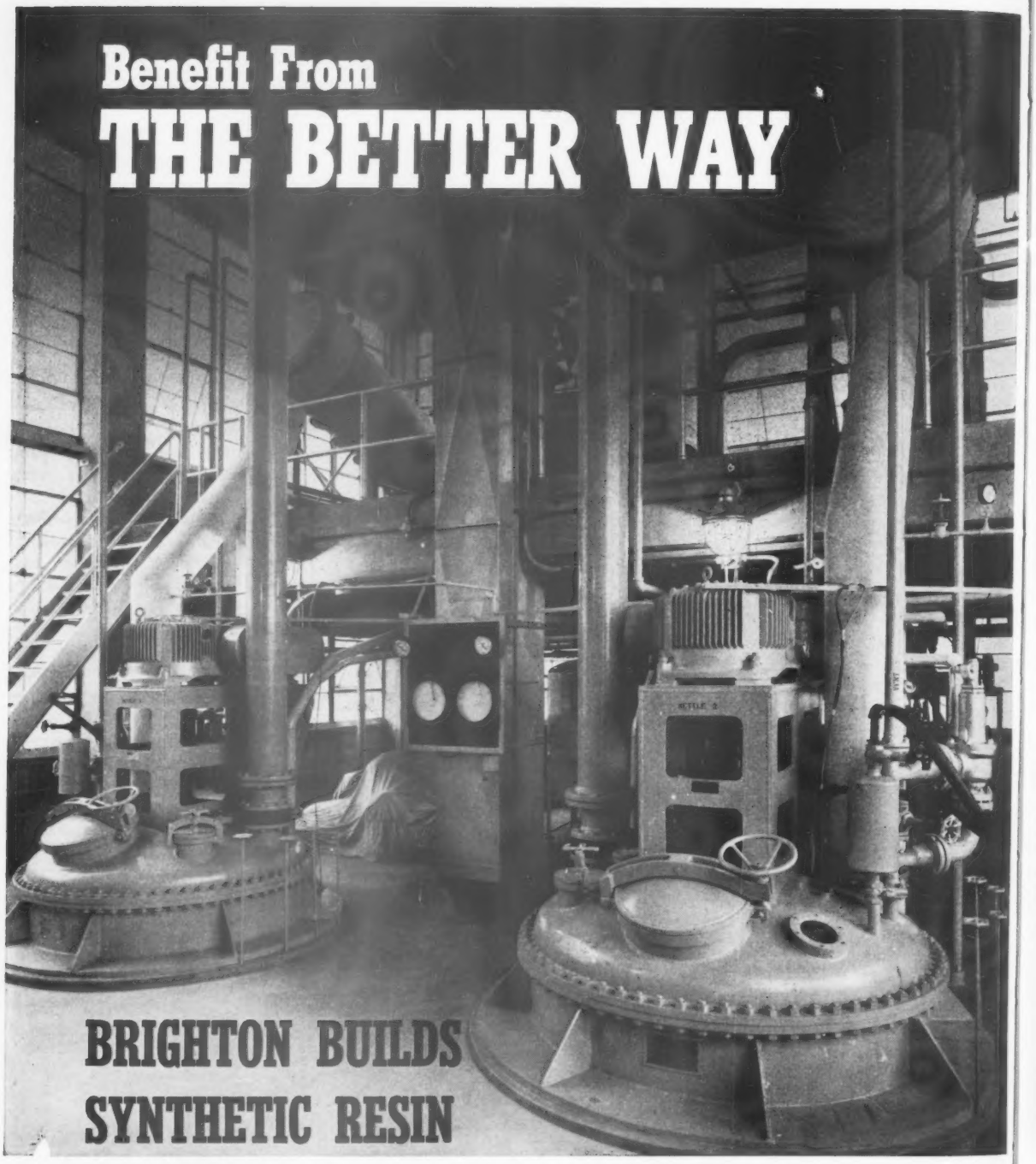
The 60 T-Line units were installed in only two days. Each unit has six shelves 30-in. wide x 24-in. deep with a 24-in. opening between shelves. Each shelf holds 270 quart cans of paint.

The new paint storage shelving simplifies the task of order picking. No longer do order pickers have to wrestle heavy cases of paint to fill orders. They simply select the number of cans they need from the shelves. Its easier to turn over paint stock properly, too, because fresh paint can be stocked in sequence on the shelves and coded for use when existing stocks are used up.

M. A. Bruder's purchasing agent reports that the new shelving also enhances the appearance of the warehouse. It has an attractive gray finish and, since it is installed along one wall, it blends neatly into the warehouse layout. Because of the benefits of this installation, the firm plans to add additional steel shelving to accommodate further growth.

For further details, on this shelving contact Penco Div., Alan Wood Steel Co., 200 Brower Ave., Oaks, Pa.

**Order picking is much easier now. Each shelf holds 270 one-quart cans. Shelves were installed in only two days using boltless T-Line channel clips, which eliminates the need for tools.**




**REACTORS . . .** Brighton Reactors speed efficiency, lower processing costs in alkyd type resins. Nearly a half century is reflected in development of Brighton Reactors, so designed to handle a variety of alkyds, yet flexible enough to meet the demands of modern processing. Other basic components available include the condenser, decanter-receiver, thinning tank, heating plant, control board.

*For "The Better Way" consult Brighton Engineers for complete details on our synthetic resin reactors.*

**BRIGHTON**
METALSMITHS EST. 1914
CORPORATION
820 STATE AVENUE · CINCINNATI 4, OHIO

# New Developments

### Hercules Powder Co. Develops "Parlon P"

"Parlon P," developed by Hercules Powder Co., is a new film-forming resin made by chlorinating polypropylene to a minimum level of 65%. In physical form this chlorinated polymer is a white, free-flowing granular powder, and is soluble in many common solvents. Since Parlon P is based on a readily available synthetic polymer of domestic manufacture, it can be supplied in any needed quantity.

Evaluation work in the Hercules Coatings Laboratory, points up the following desirable properties. The new polymer has excellent solution color, produces clear water-white films, appears equal to Parlon® chlorinated natural rubber in chemical resistance, and has noticeably better heat- and light-stability.

Heat- and light-stability are improved still further when up to 3% of an epoxy-type stabilizer such as Stabilizer A-5 is added.

The new chlorinated polypropylene is available in the viscosity range, as measured in 20% toluene solutions, of 5 cps. (P-5) to 125 cps. (P-125). Typical properties of material in this range, in 20% toluene solution, are:

Color, Gardner
1933 Standards 2 max.
Sward hardness, % of glass† 40-50

†Tests run on films 83:17 polymer: dioctyl sebacate

Parlon P is soluble in toluene, xylene, and other aromatic hydrocarbons; in esters such as butyl acetate and Cellosolve acetate; in methyl ethyl ketone, methyl isobutyl ketone, and other ketones; and in chlorinated solvents such as carbon tetrachloride. It is not soluble in alcohols or aliphatic hydrocarbons. The polymer is quite compatible with the chemical plasticizers such as dioctyl phthalate and dioctyl sebacate, and with chlorinated materials such as Clorafin® and the Aroclors.

The resin compatibility of Parlon P (chlorinated polypropylene) does not appear to be as broad as that of Parlon (chlorinated natural rubber), particularly with alkyds. However, the subject of resin compatibility has not yet been thoroughly evaluated.

**EVALUATION OF CLEAR "ALL-CHLORINATED" LACQUERS BASED ON PARLON P**

| | Formulation | |
|---|---|---|
| **Composition** | **A** | **B** |
| Parlon P, P-10 | 55.0 | — |
| Parlon P, P-20 | — | 55.0 |
| Aroclor 5460 | 15.0 | 15.0 |
| Aroclor 1254 | 24.0 | 24.0 |
| Dioctyl sebacate | 4.3 | 4.3 |
| Stabilizer A-5 | 1.7 | 1.7 |
| % Solids by weight in toluene | 50.0 | 50.0 |

Lacquers were sprayed on 4 by 6-in. "bonderized" steel panels. Film thickness was 2.5-3.0 mils dry. Films were air-dried 72 hours before testing.

| **Film Properties** | | |
|---|---|---|
| 300°F. heat stability | | |
| 1 hour | v.sl.yellow | v.sl.yellow |
| 2 hours | v.sl.yellow | sl. yellow |
| 3 hours | sl. yellow | mod. yellow |
| 5 hours | mod. yellow | — |
| 18 hours | black | — |
| Fade-Ometer stability | | |
| 24 hours | sl. yellow | v.sl.yellow |
| 48 hours | sl. yellow | sl. yellow |
| 96 hours | mod. yellow | sl. yellow |
| 144 hours | mod. yellow | brown |
| Chemical resistance after 2 weeks' exposure | | |
| $H_2O$ | excellent | excellent |
| 10% HCl | excellent | excellent |
| 1% NaOH | excellent | excellent |

### Saturated Furan Rings Issues Challenge

Challenging opportunities for the imaginative chemist exist in the hydroxyl group attached to each of the two saturated furan rings in the structure of isosorbide ($C_6H_{10}O_4$), according to the Product Development Dept., Chemicals Div., Atlas Powder Co.

The use of isosorbide as a chemical intermediate in the preparation of esters and ethers for especialty solvents and plasticizers immediately suggests itself. Lubricants, heat transfer media, and hydraulic fluids are other areas of application.

Derived from sorbitol ($C_6H_{10}O_4$), isosorbide (1, 4:3, 6-dianhydro-D-glucitol) is a polyol. Its unusual structure with two fused "cis"-orientated tetrahydrofuran rings gives the effect of an "open book" when viewed in perspective.

Isosorbide is a white crystalline solid with a high flash point and humectant properties similar to sorbitol. It is soluble in water, alcohol, glycerol, and other polar solvents. The physical properties of isosorbide indicate its potential use as a humectant and plasticizer in paper, tobacco, textiles, glue compositions, cork products, cosmetics, and pharmaceuticals.

## New Specialty Primer Serves Dual Role

The new specialty cold-applied, inhibitive primer was formulated by Koppers Co., Inc., for use in contaminated industrial or marine atmospheres.

The new primer, Bitumastic 11-S, serves a dual role:

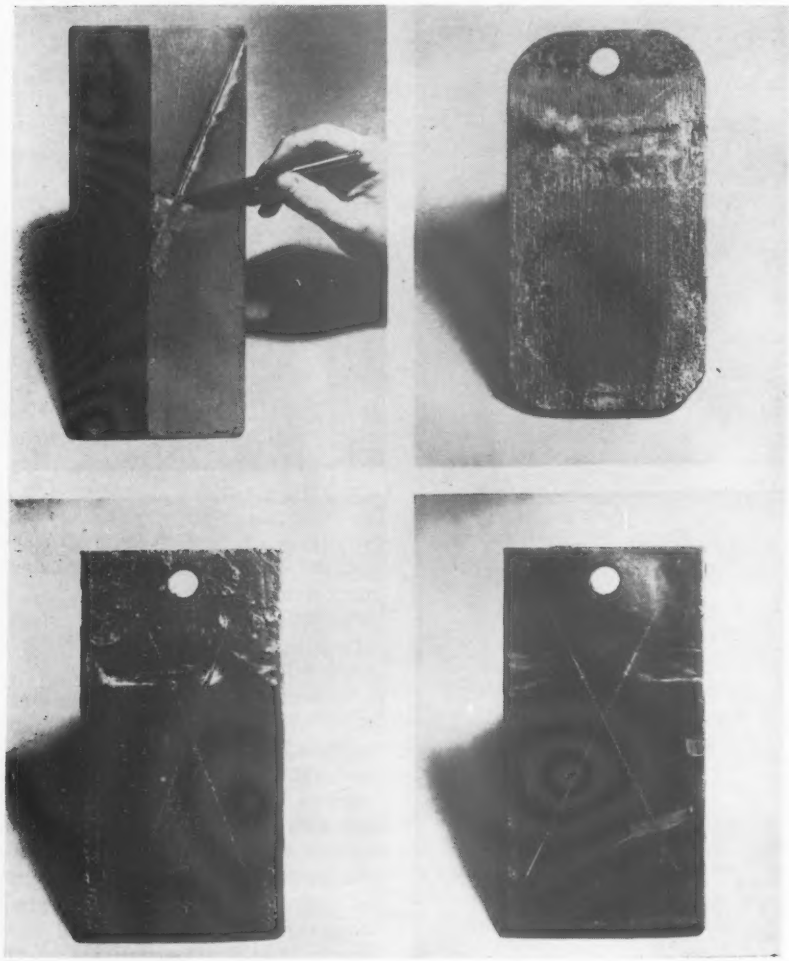
1. As a shop primer to prevent contamination from attacking the surface before the protective coating can be applied.

2. To prevent undercutting where mechanical damage produces breaks in the protective coating, after applied.

The panel shown in the upper left-hand photo was coated with Bitumastic 11-S and then the right half was immersed in artificial seawater at 140°F. for 30 days. Corrosion shows only along the score mark and when this stain is scraped away no undercutting from the score itself can be seen.

The other three photos show panels primed with zinc chromate (upper right), lead-silico chromate (lower left) and Bitumastic 11-S (lower right). All three were half-immersed in a boiling 5 per cent saline solution, kept at 220 degrees F., for 30 days. On the first two, blistering and undercutting have progressed noticeably, with destruction particularly noticeable in the area exposed to vapor. But on the Bitumastic 11-S primed sample there are no corrosive effects except, again, where the coating has been scored through to metal.

A further area of usefulness for 11-S has been uncovered by Koppers tests: results are good even where the surface preparation of the metal is less than ideal. No claim is made that it will penetrate heavy rust, but it has been successful in passivating the metal and preventing the further development of rust tubercles.



## Union Carbide Announces Phenolic Shell Molding Resin For Hot Coating Sand

A new stable novolac resin developed especially for hot-processed sand coating was recently announced by Union Carbide Plastics Co., Division of Union Carbide Corp. The new material, Bakelite phenolic resin BRR-7151, is said to be ideal where production speed is necessary.

Superior hot strength of BRR-7151 allows for faster cures and freedom from shell warping or cracking. Melt viscosities of the resin are such as to provide the best flow for higher shell or core strength, ideal shell weight pick-up in rapid investment cycles, and optimum green strength on pattern plates. Developed for rapid coating of hot sand, this resin is ideal for all types of hot coating equipment.

Commercial quantities of the material are now available from Union Carbide Plastics distribution points.

## Benzidine Yellow HH 12229 Developed by Sherwin-Williams

Benzidine Yellow HH 12229, a high hiding, low oil absorption type Benzidine Yellow pigment for lead-free paints, has been developed by the Pigment, Color & Chemical Div., Sherwin-Williams Co.

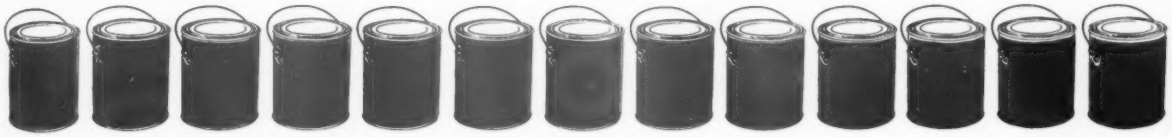
This pigment has been especially designed for use when Chrome Yellows are not suitable because of restrictions on lead and where Hansa Yellows will not stand the baking temperatures involved.

The low oil absorption characteristic of Benzidine Yellow HH 12229 makes it different from other Benzidine Yellows. The paint formulator no longer needs to avoid Benzidine Yellows or to use them sparingly because of their "puffiness." He can now use the amount of pigment necessary to obtain the desired hiding without considering its effect on body. The high gloss of enamels made with 12229, made possible by the low oil absorption, is maintained for the life of the coating.

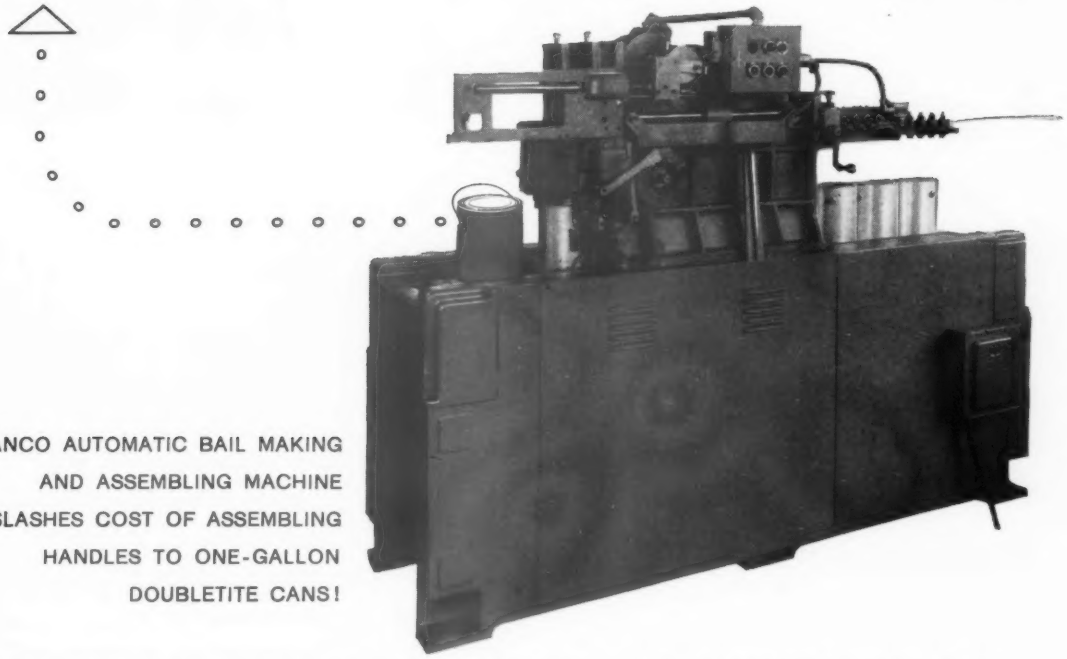
This new standard, having the good heat resistance of Benzidine Yellows, may be used in normal baking schedules common in the paint industry.

# PAINT INDUSTRY PRODUCTION BONANZA!

## NEW CANCO MACHINE FORMS AND ATTACHES



## UP TO **40 BAILS PER MINUTE** . . . AUTOMATICALLY!



CANCO AUTOMATIC BAIL MAKING AND ASSEMBLING MACHINE SLASHES COST OF ASSEMBLING HANDLES TO ONE-GALLON DOUBLETITE CANS!

With full line production, this new machine can pay for itself in just one year! Valuable to the small producer as well as the large.

*Cuts production costs.* Shapes and assembles 25 to 40 bails per minute . . . frees 4 men (bail maker, bail carter, bail sorter, bail inserter) for other tasks. Eliminates expense of packaging, handling, and storing pre-formed bails.

*Cuts Plant costs.* Takes up approximately 14 square feet . . . can easily be integrated into your production line Increases production speeds. Simple maintenance.

*Canco's Automatic Bail Making and Assembling Machine* shapes unformed coil wire into bails, then attaches the bail to each one-gallon doubletite can. Bails are safe, firm, dependably attached. This machine has been designed to accommodate all types of one-gallon paint cans.

*With this machine, Canco offers complete service facilities and repair parts.* The development of this machine, plus total Canco service, are two of the many ways in which Canco contributes to progress in the paint industry. Write or phone your nearest Canco office for complete information.

**CANCO DIVISION · AMERICAN CAN COMPANY**

SALES OFFICES IN PRINCIPAL CITIES

# From the HIGHEST to the LOWEST

**OTHER GRADES OF AZO ZINC OXIDES IN A WIDE RANGE OF OIL ABSORPTIONS**

Where necessary to meet your requirements we can select within grades the *exact* degree of desired oil absorption.

**NOTE:** AZO paint grade zinc oxides available as AZODOX (de-aerated). AZODOX has twice the apparent density, half the dry bulk of conventional oxides.

1ST

American Zinc was the first, *and is still the only* producer of acicular lead-free zinc oxides covering a wide range of oil absorptions from high to low *and including the intermediate ranges.*

*For Example:*

**When high consistency is wanted, use . . .**

**AZO ZZZ-22**

This is the original high oil absorption acicular zinc oxide. The unusual weathering properties imparted to paints by AZO acicular type zinc oxides are present to the highest degree in AZO ZZZ-22.

**When very low consistency is wanted, use . . .**

**AZO ZZZ-55 or AZO ZZZ-55-LO**

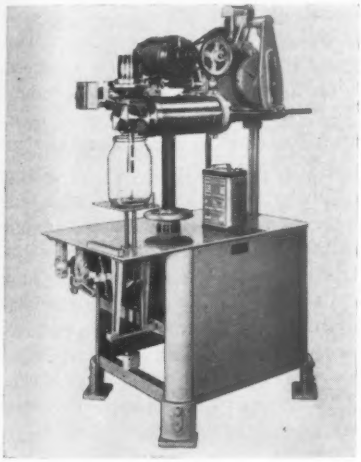
Highly recommended for general paint formulations where very low oil absorption zinc oxide is desired. Absence of colloidal fines assures good weathering characteristics. Round particle shape.

American Zinc sales company

*Distributors for* AMERICAN ZINC, LEAD & SMELTING COMPANY
COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

# NEW EQUIPMENT AND MATERIALS

**This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.**



ELGIN

### SINGLE VALVE FILLER

**Accommodates Glass and "F" Tins**

New machine is designed to accommodate all glass and "F" tins up to 1 gallon and give faultless delivery of products in the food, paint, cosmetic and oil fields.

According to the firm, the new precision engineered model uses a special three-inch pipe feed, one gallon cylinder and piston with a fine fill attachment on an automatic lift table.

Low in initial cost and easily serviced, the new bottom-fill filler takes only minimum floor space—24 x 35 inches.

Elgin Manufacturing Co., Dept. PVP, 200 Brook St., Elgin, Ill.

### BARREL TRUCK

**Facilitates Pallet Loading**

A drum and barrel truck, which is said to make it possible for one operator to easily place heavy drums on pallets, has just been announced.

Designated Ezy-Rol Barrel Cart, the manufacturer states that the design of this truck allows the barrel to be carried at pallet height so that in one forward motion the drum can be placed on a pallet with a minimum of operator effort. It is also said that drums can be safely lowered from pallets with this cart.

Although an extra set of wheels is primarily used on this truck to facilitate pallet loading, the four wheels do carry the entire load thereby greatly reducing operator

VALLEY CRAFT

effort when moving heavy drums.

The hazard of moving heavy drums down ramps or steep inclines can also be eliminated with this truck, it is claimed, as it is available with two-wheel safety brakes which give the operator complete control of the load.

The main frame of this barrel truck is said to be constructed from heavy steel tubing with a 1" diameter replaceable axle. It is also available in aluminum where light weight is a factor such as in delivery service.

Wheels are equipped with ball bearings to provide an "easy roll" regardless of temperature or weather conditions. Solid rubber tires or pneumatic wheels are optional.

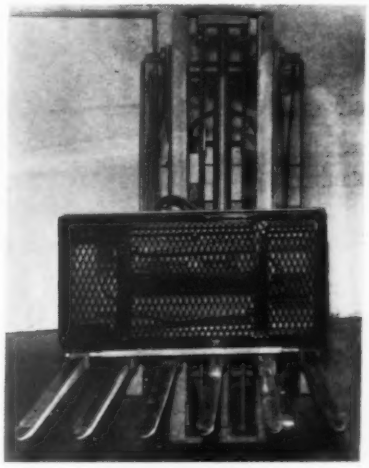
Valley Craft Products, Inc., Dept. PVP, 770 Jefferson Ave., Lake City, Minn.

### PUSH-OFF DEVICE

**Handles Loads in Process**

A push-off device with side shifter and multiple forks has been developed for establishments using a take-it or leave-it pallet system.

This is the system whereby unit loads are handled in process and placed in storage on pallets but are shipped without pallets. The multipurpose equipment is capable of handling the palletized unit loads in process and storage and also the non-palletized loads during shipment. During process and in storage the palletized loads are handled in the conventional manner. When loading carriers, the



LEWIS SHEPARD

multiple tined forks are slid between the small stringers on the top of the pallet and the load is raised off. The load is then moved to the carrier and pushed off the forks.

Lewis-Shepard Products, Inc., Department PVP-R10-29, 125 Walnut St., Watertown 72, Mass.

### DISPERSER

**Push Button Control**

New, completely automatic, variable speed, push button control disperser is now available. Machine features a unique impeller,

patent pending, which is designed with a jutting angle outward from the center. Each blade has two holes which throw material into the vortex, reducing it and eliminating air pockets at very high or low speeds. Thus, paint, ink, or any other materials dispersed are ready for immediate canning without the ordinary delay of waiting for air to leave the material by rising to the surface.

The impeller's holes also produce an additional inner swirl so that materials dispersed swirls up and under and through the holes inward, creating a multi-action, giving greater shearing value, and lessening dispersion time. The head of the blade is a sharp half-circle with a hook effect, designed for dissolving and shearing as well as dispersing pigments, cold cutting resins and other materials.

The disperser is completely hydraulic, requiring only two gallons of oil to operate. Compressed air is not needed. All hydraulic hoses are made of flexible steel tubing, eliminating leaks and excessive maintenance. The disperser has a variable shaft speed of from 800 to 2,400 rpm.

The machines have been carefully engineered to eliminate excessive hydraulic power. To install a disperser, all that is needed is a 220-volt line to drive the motor. It can be installed in ten minutes. The machine is manufactured in three sizes—laboratory model, 10 hp., and 20 hp. Special sizes can be made on request.

Shar Dispersion Equipment Co., Inc., Dept. PVP, 2829 James St., Fort Wayne, Ind.

### ISANO OIL
**Checks Fire Spread**

Durable fire retardancy both inside and outside of combustible buildings is now a reality. The spread of flames can be checked with intumescent paints — paints that puff on heating to form an insulating layer so effective that the fire is retarded.

These paints contain Isano Oil, which, when heated, has the unusual property of giving off a gas that expands the paint film. This expanded insulating paint film remains intact over the surface, keeping the air away and the temperature of the substrate down. This property is found in no other commercial oil.

Most intumescent paints are partially water soluble and are prone to loss of their puffing qualities when exposed to weather. The intumescent paints containing Isano Oil, however, are ready to act instantly to check the spread of fire year after year. Reports of exposure data indicate that there was no loss of fire retarding properties on this paint when exposed outdoors for two and one half years. In addition, this paint protected the building from normal weathering as well as a conventional house paint does. No other intumescent paint is known to be as weather resistant.

Isano Oil, also known as Boleko Oil, recently has become commercially available in large quantities from Pacific Vegetable Oil Corp., Dept. PVP, 1145 So. Tenth St., Richmond, Calif.

### SYNTHETIC PEARL ESSENCE
**Twin Inherent Colors**

New synthetic pearl essence provides color along with pearly lustre. Available in formulations for surface coating and for incorporation

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into plastics, the colors provide multiple color effects which cannot be achieved with conventional colorants.

While the colors react like conventional pearl pigments in all respects, they have twin inherent colors: one observed by reflected light, and the second seen by transmitted light. For example, a polyester cast sheet containing the red pigment appears red when held against a dark background and examined by reflected light, and appears green when viewed by transmitted light.

Colors such as gold, red blue, green, and orange are now available. These colors are produced by optical effect rather than by the absorption of a particular band of wave lengths as occurs with ordinary dyes and pigments. Multicolor effects may be obtained by using several colors in combination. The colors are rather subtle, and of moderate intensity, but the two-color play inherent in each pigment makes possible effects which cannot be otherwise achieved, and which verge toward iridescence.

Colors are available in formulations for use with most coating vehicles and for most plastics.

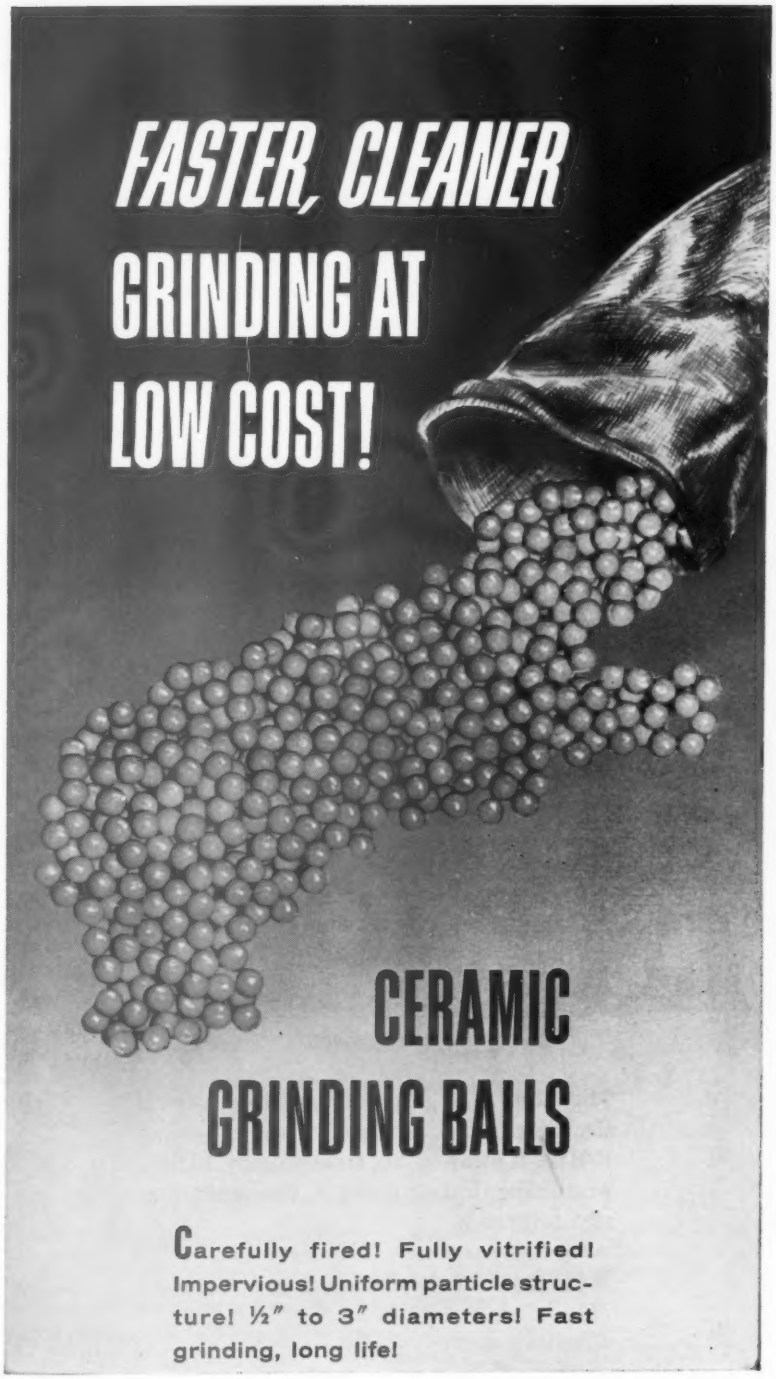
Mearl Corp., Dept. PVP, 41 E. 42nd St., New York 17, N. Y.

**POLYVINYLINDENE CHLORIDE**
**Laminating Eliminated**

New water-system, latex form of polyvinylidene chloride resin is highly stable and will, when used as a coating material, impart a much sought-after combination of outstanding barrier and protective properties.

This new material, called Resyn (R) 3600, (trade name to be announced) can be applied at low cost to a variety of porous and non-porous substrates by standard coating equipment. Need for laminating or extrusion operations is therefore eliminated. Furthermore, all the protective properties of polyvinylidene chloride film are said to be retained in the final coated surface.

Among these properties, the firm stressed the new coating's extreme resistance to transmission of water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vapor and common gases such as oxygen, nitrogen and carbon dioxide.

Immediate applications for Resyn 3600 will be in the paper, corrugating and packaging fields. These industries vitally need protective coatings that offer exceptional barrier properties and can be economically combined with low cost materials. Subsequent uses, he said, should develop soon in the textile, agricultural, construction, adhesive, and many other product lines.

National Starch and Chemical Corp., Dept. PVP, 750 Third Ave., New York 17, N. Y.

## UNCUT RESINS
### Pale Straw Color

Uncut resins, direct from the cooking vat, that are particularly well suited for metalizing, have been announced.

These uncut resins permit adjustment of solids content and viscosity by the user to meet specific needs. They are suitable for thinning with low-cost, readily available materials with flash points above 100°F.

Adjustment of solids content and viscosity, by the user, permits the application of a high solids mix for uniform, high gloss on porous and rough die castings, or a very thin coating on smooth metal surfaces for the same type of finish. Recommended thinners include super high-flash naphtha, Solvesso #100, or slower drying Solvesso #150.

Standard baking schedule ranges from 20 to 60 minutes at temperatures ranging from 250 to 350 degrees F. In the use of infra-red heating with automatic conveyors the curing time may be speeded up to two minutes.

Application of base and top coats may be made with the improved method of flow-coating, followed by short air-drying on a revolving rack; or by automatic spraying methods.

The "MC baking type lacquer resin" has an extremely pale straw color which is suitable for use on silver nitrate coatings and for protection of polished brass, aluminum and zinc die-castings. It is sold by the pound in standard five-gallon pails and 55-gallon steel drums.

Schwartz Chemical Co., Dept. PVP, 50-01 Second St., Long Island City, N. Y.

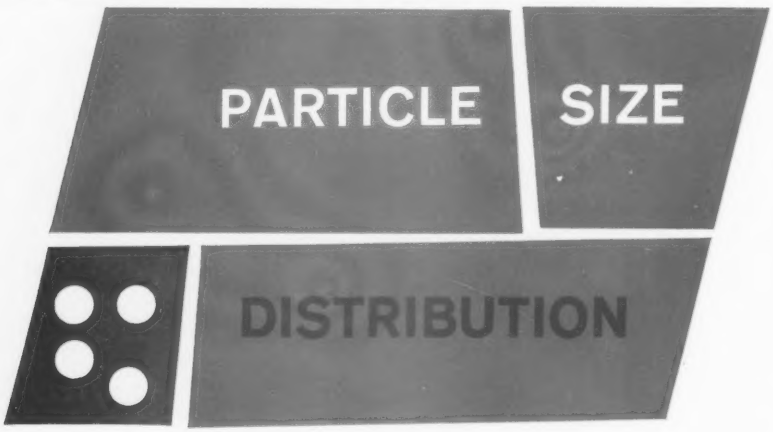
## FILTER HOUSING
### Straight-Thru Design

Special features of a new filter housing include a straight-thru design. This feature permits the bowl to be removed from the pipe line without disturbing the pipe connections. The container design permits fabrication in a wide variety of materials with maximum cleaning ease and accessibility to all fluid passageways.

The housing is generally furnished in type 304 stainless steel, or, on special order, in an alloy to match the porous stainless steel standard elements. Corners are rounded, where possible, both inside and outside. A quick-opening closure makes removal of the bowl and replacement of the element a matter of seconds. Housings can be designed to withstand up to 10,000 psi; 125 or 300 psig is standard.

Elements can be supplied of PSS® porous metal for use with or without a filter aid, as cylinders, bayonets, stars or in special types such as RIGIMESH® corrugated sintered woven wire mesh. Filtration ratings of elements range from 2 to 55 microns nominal (98%) with absolute ratings as low as 15 microns available with certain types of elements.

Pall Corp., Dept. PVP, 30 Sea Cliff Ave., New York, N. Y.




Minimum average particle size, or particle size distribution, is another way of saying R-B-H. It means gloss, transparency, hiding, weathering, tinting strength, flow and abrasion resistance.

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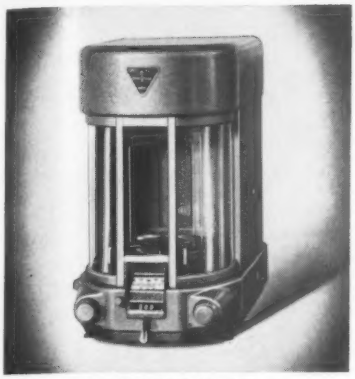
R-B-H Dispersions

INTERCHEMICAL CORPORATION
Color & Chemicals Division
HAWTHORNE, New Jersey

Pigment dispersions in nitrocellulose; ethyl cellulose; urea formaldehyde; vinyl and alkyd resins; chlorinated rubber and other plastic binders.

R-B-H is a trademark of Interchemical Corporation.

## NEW MATERIALS — EQUIPMENT



C. H. STOELTING

### LABORATORY BALANCE
**Weight Placing System**

The "FW 55" high speed laboratory balance combines a direct reading electro optical scale with an automatic weight placing system operated by two dials. The long optical scale of 10,200 mg (10.2 gr.) gives the "FW 55" a performance capability of a speed at least three times as fast as other analytical balances in its class. The dials, pan, and read out scales are located in the same line of vision, to eliminate fatigue when the balance is used continuously.

C. H. Stoelting Co., Dept. PVP, 424 N. Homan Ave., Chicago 24, Ill.

### DISSOLVERS
**Stationary Mounted**

New, variable-speed dissolvers, designed for mounting on fixed tanks and applicable to a wide variety of mixing problems, are announced.

The variable-speed drive mechanism is capable of delivering 90% of motor horsepower to the impeller even at lowest speeds, regardless of changes in material or viscosity. Speeds may be easily changed without stopping the machine.

Ranging up to 40 horsepower in size, these high-speed, high-shear, impeller-type mixers may be mounted on almost any stationary tank anywhere.

Applications include general mixing operations, dissolving, emulsifying and de-agglomerating. Materials which may be processed include solid-liquid, liquid-liquid and gas-in-liquid formulations. Viscosities up to 50,000 centipoises or more can be easily handled.

The new units are especially suitable for meeting special mixing problems that require sealed tanks to avoid vapor loss. They also can be easily adapted for use in vacuum and pressure tanks. They may be operated at high speed in original processing and then slowed down for simple agitation or to keep materials in suspension when desirable.

Due to relatively high-speed operation, the units are correspondingly compact and lightweight and produce large volumes in small space. Impellers are non-clogging and self-cleaning.

Morehouse-Cowles, Inc., Dept. PVP, 1150 San Fernando Rd., Los Angeles 65, Calif.

### COLLOIDAL DISPERSIONS
**Aqueous Combatible**

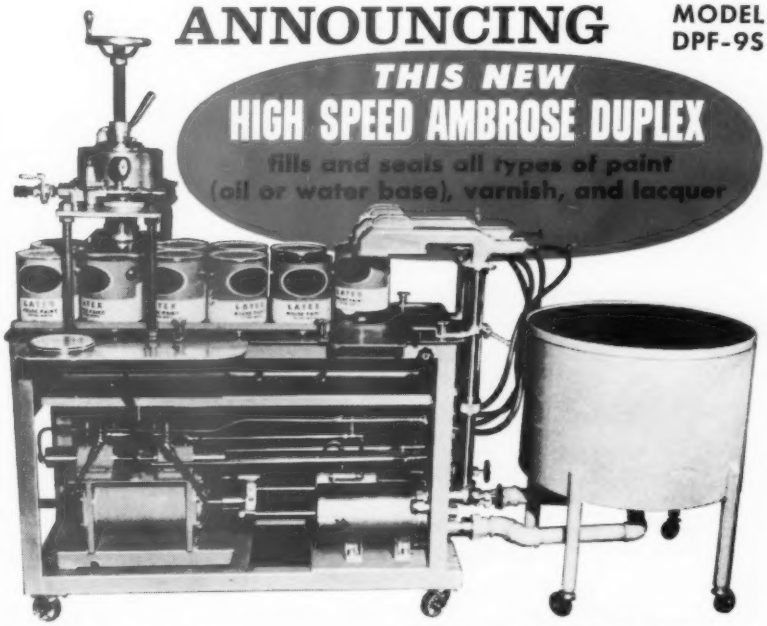
New series of dispersions of carbon blacks is available in either butyl alcohol or isopropyl alcohol. These colloidal dispersions are being marketed under the "Alcoblaks" trade name. Four different carbons in each of the alcohols are currently available. Laboratory tests indicate good compatibility with many resins in aqueous as well as solvent systems.

Columbian Carbon Co., Dept. PVP, 380 Madison Ave., New York 17, N. Y.


ANNOUNCING MODEL DPF-9S

THIS NEW HIGH SPEED AMBROSE DUPLEX

fills and seals all types of paint (oil or water base), varnish, and lacquer



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# PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

### Tinting Base Composition

*U. S. Patent 2,942,997. Leonard S. Bram, Iselin, and Louis F. Vecchio Rockaway, N. J., assignors to Benjamin Moore & Co., New York, N. Y., a Corp. of New Jersey.*

As a composition of matter a fluid colorant useful in coloring coating composition comprising as the essential ingredients a mixture of:

(*a*) A first nonionic ether selected from the class consisting of alkyl and alkaryl alkylene glycol ethers which are soluble in water, ethylene glycol and polar solvents and having a range of from 9 to 15 oxyalkylene groups;

(*b*) A second nonionic alkaryl alkylene glycol ether which is at most partially soluble in water and ethylene glycol, and miscible with hydrocarbon solvents and having a range of from 1 to 7 oxyalkylene groups;

(*c*) A hydrocarbon solvent;

(*d*) A latent solvent selected from the class consisting of water soluble and volatile alkyl ketones, alkylene glycols, mono- and di-alkyl ethers of alkylene glycols, mono- and di-esters of alkylene glycols, and ether esters of alkylene glycols; having intimately dispersed therein a pigment said pigment having a maximum water soluble salt content of 0.5% and being made up, at least in part, of colored pigment with the latter constituting from 10% to 70% by weight of the total colorant and with the total pigment constituting from 30% to 85% by weight of the total colorant; said first and second nonionic ethers consistuting from 10% to 45% by weight of the total colorant, said second nonionic ether constituting from 7.0% to 30% by weight of said total colorant, said hydrocarbon solvent constituting up to 17% by weight of the total colorant and the latent solvent constituting from 4.0% to 11% by weight of the total colorant.

### Thermoplastic Compositions

*U. S. Patent 2,935,415. Jack Linsk, Highland, Ind., assignor to Standard Oil Co., Chicago, Ill., a Corp. of Ind.*

A thermoplastic composition consisting essentially of cellulose acetate containing between about 51 and 57 weight percent of acetic acid in an amount of about 20-40 weight percent and the remainder essentially a plasticizer selected from the class consisting of dinitrophenoxyethanol and mixtures of dinitrophenoxyethanol with bis(dinitrophenoxy)ethane which mixtures contain not more than 50 weight percent of said bis(dinitrophenoxy)ethane.

### Coating Composition For a Wax Surface

*U. S. Patent 2,936,245. Lloyd O. Osipow, Munsey, N. Y. & Dorothea C. Marra, Summit, N. J., assignor to Fannie Roberts Heyman.*

A coating composition adapted for the over-coating of a wax surface, which consists essentially of a liquid solution of about 1%, by weight, to about 10%, by weight, of an ethanol-soluble type of ethyl hydroxyethyl cellulose in an organic solvent mixture of ethanol and a volatile, completely halogenated fluorochloro hydrocarbon, which is a liquid at 25° C. when under atmospheric pressure.

### Metallized Coating Compositions

*U. S. Patent 2,941,894. Walter R. McAdow, Grosse Pointe Farms, Mich., assignor, by mesne assignments, to American-Marietta Co., Chicago, Ill., a Corp. of Illinois.*

A metallizing coating composition comprising a film-forming coating vehicle, pigment and a metallizing component, said metallizing component being present in amounts from 0.028% to 0.15% based on the weight of said composition and being aluminum, said metallizing component being particles produced by breaking up smooth surfaced film of metal formed by deposition on a smooth surfaced base, said film having a thickness in the range between 3 millionths of an inch and about 25 millionths of an inch, a reflectivity of at least about 85% and covering from 40,000 to 60,000 $cm_2$./gm., said vehicle containing a material selected from the group consisting of cellulose nitrate,

Weather testing translucent fiberglas for outdoor use in an Atlas Weather-Ometer at the Alsynite Company of America.

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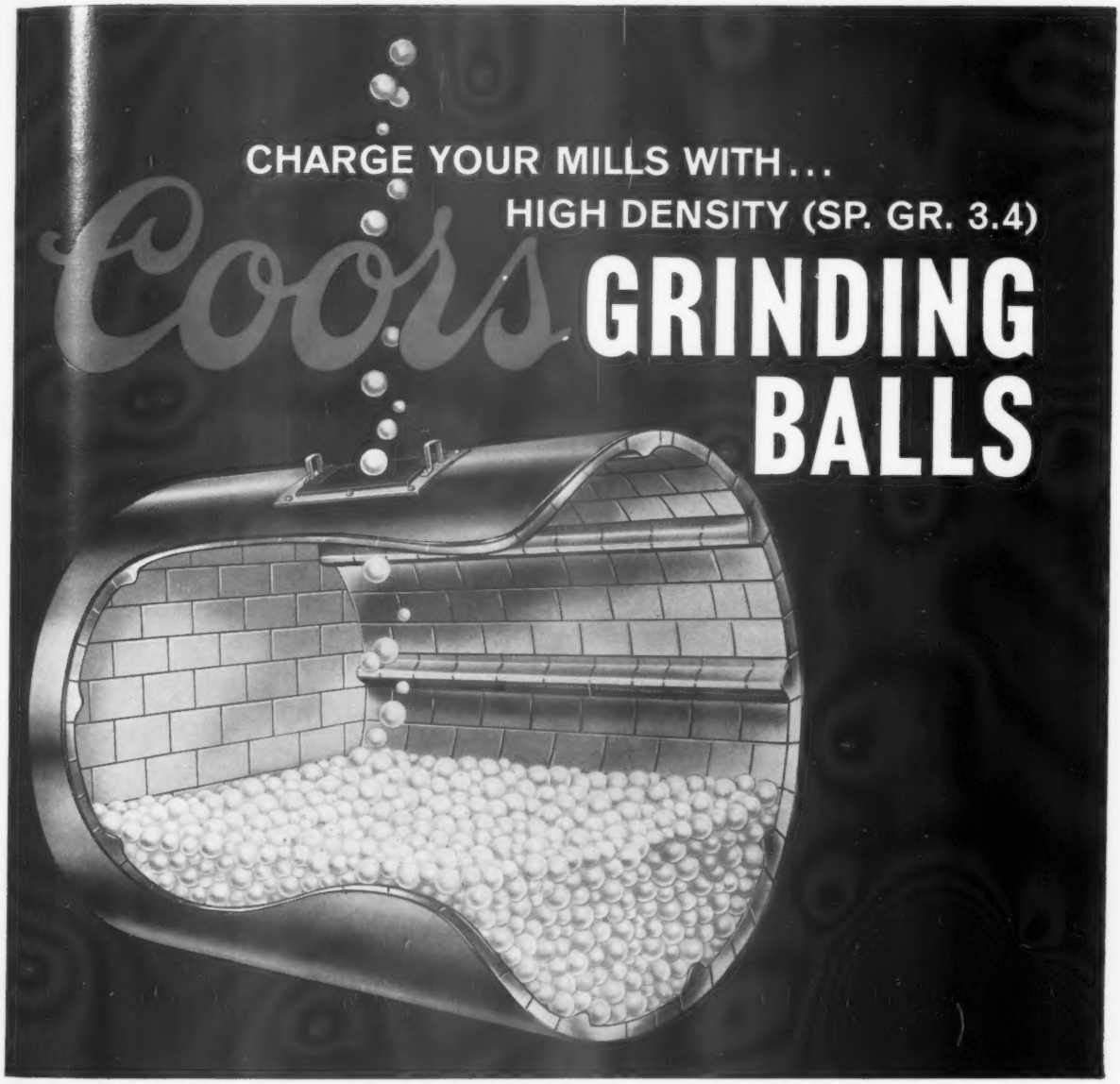


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vegetable oil modified alkyd resin, amino-aldehyde resin and phenol-aldehyde resin and being one which sets to a matrix adherent to base materials and being of a nature to permit the passage of at least some light therethrough, and said pigment being present in an amount sufficient to limit light passage through the coating without rendering the coating opaque.

### Stabilizing the Viscosity of Oxidized Drying Oils

*U. S. Patent 2,942,996. John F. McDay, Cranford, and Anthony H. Gleason Westfield, N. J., assignors to Esso Research and Engineering Co., a Corp. of Delaware.*

A composition having a stable viscosity consisting essentially of 100 parts by weight of an oxidized drying oil, said oxidized drying oil being prepared by polymerizing a mixture of from 75 to 100 parts by weight of butadiene-1,3 and 25 to 0 parts by weight of styrene in the presence of about 1 to 5 parts by weight of finely divided alkali metal catalyst at a temperature between about 40 and 85° C. and blowing the resulting drying oil with an oxygen-containing gas at a temperature between about 20 and 150° C. until the oil contains from a trace up to 20 wt. percent combined oxygen, about 50 to 300 parts by weight or an aromatic hydrocarbon diluent and 0.2 to 1 part by weight of ditertiary amyl hydroquinone dissolved in said diluent.

### Resinour Coating Compositions

*U. S. Patent 2,940,944. Roger M. Christenson, Richland Township, Allegheny County, Pa., assignor to Pittsburgh Plate Glass Co., a Corp. of Pennsylvania.*

A heat hardenable resinous composition comprising an ester of an epoxy fatty acid containing at least 8 carbon atoms, said ester containing only atoms of carbon, hydrogen and oxygen, and an interpolymer of an amide selected from the group consisting of acrylamide, methacrylamide and itaconic diamide and at least one other monomer containa $>C=CH_2$ group, said interpolymer containing from about 5 to 45 percent by weight of said amide in polymerized form based on the total weight of said interpolymer and being characterized by having amido hydrogen atoms replaced by the structure

$$\begin{array}{c} R \\ | \\ -CHOR_1 \end{array}$$

wherein R is a member of the class consisting hydrogen, furyl and a saturat lower aliphatic hydrocarbon radical and $R_1$ is a member of the class consisting of hydrogen and lower alkyl radicals, said ester being present in an amount of from about 5 to about 50 percent by weight based on the weight of the resinous components of said composition.

### Allyl Alcohol-Vinyl Aromatic Copolymers

*U. S. Patent 2,940,946. Edward C. Shokal, Walnut Creek, and Paul A. Devlin, Orinda, Calif., assignors to Shell Oil Co., a Corp. of Delaware.*

A synthetic drying fatty ester having an acid number less than 20 which comprises the reaction product of a fatty acid of 12 to 20 carbon atoms and an allyl alcohol-mono-vinyl aromatic copolymer, the mono-vinyl aromatic being selected from the group consisting of styrene, para-methyl styrene, ortho-methyl styrene, meta-methyl styrene, 2,4-dimethyl styrene, para-chlorostyrene, para-ethyl styrene and beta-vinyl naphthylene, the copolymer containing from about 15% to about 85% by weight, of combined vinyl aromatic, the copolymer having a molecular weight ranging from about 300 to about 4000, being essentially free of carbonyl values, having a color ranging from essentially colorless to a light yellow and being free of gel after heating for four hours at 250°C., the copolymer being further characterized as being insoluble in water and mineral acid and being soluble in a solvent selected from the group consisting of methanol, acetone, chloroform.

### Coating Compositions and Coated Structures

*U. S. Patent 2,939,794. Clarence E. Wilkinson, Port Neches, Tex., assignor to Texaco Inc., a Corp. of Delaware.*

A fire resistant coating composition consisting essentially of about 30-55% asphalt, about 15-30% volatilizable diluent, about 5-15% fine asbestos, about 5-10% fine mica, about 5-15% fine expanded vermiculite and about 2-8% fine alkali metal tetraborate.


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Witco manufactures its paint chemicals under strictest production control to insure uniform quality and outstanding performance. So if you're looking for quality paint chemicals, look to Witco for: DRIERS • METALLIC STEARATES • EXTENDERS • EMULSIFIERS • SURFACE ACTIVE AGENTS • PLASTICIZERS • PHTHALIC ANHYDRIDE • CARBON BLACKS

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# TECHNICAL Bulletins

### POLYVINYLPYRROLIDONE

A new 22-page "PVP Formulary", a guide to new and improved products incorporating polyvinylpyrrolidone, has been issued.

Formulations are given for more than 30 specific products in five major groups—cosmetics and toiletries, pharmaceutical and veterinary products, soaps and detergents, adhesives, and coatings. Aerosol, aqueous, and organic—solvent systems are described. Considerable details are supplied for individual products, including required ingredients and suggested techniques of manufacture.

The characteristics of PVP, as applied to each end-use, are noted in a preface to each of the five groups, which utilize this acetylene-derived chemical's desirable and versatile properties.

The booklet suggests new applications for both industrial and pharmaceutical (Plasdone*) grades of PVP, and it is arranged in such a way that it will serve as a convenient reference and guide.

The booklet opens with a brief general discussion of the advantages of PVP not only as an additive but as an integral part of many different types of products. New and interesting applications for PVP are constantly being developed, and this booklet should stimulate further activities as well as assist in current production.

Antara Chemicals, Sales Div. of General Aniline & Film Corp., Dept. PVP, 435 Hudson St., New York 14, N. Y.

### SODIUM ALUMINATE

Industrial uses of sodium aluminate, which rose to prominence as a water-treatment chemical, are described in a two-color, 12-page brochure. Entitled "Sodium Aluminates," the brochure outlines how the chemical can be used in such industries as chemical processing, cement and mortar, detergent, glass and ceramic, paint and pigment, pharmaceutical, pulp and paper, rubber and textile.

The brochure also describes sodium aluminate's physical and chemical characteristics.

Nalco Chemical Co., Dept. PVP, 6216 West 66th Place, Chicago 38, Ill.

### ATTRITON MILLS

New bulletin covers firm's complete line of Attrition Mills.

Featured in this bulletin are the "Frigidisc" Single Runner Attrition Mills and the "Attritor" Mills. The "Frigidisc" is designed for water or brine cooling of both rotating and stationary plates to prevent products from overheating. The "Attritor" Mills are pressure fed for grinding and dissolving the crumb content of chemical solutions in the manufacturing of synthetic fibers, especially those made from pulp.

Robinson Div., The Young Machinery Co., Inc., Dept. PVP, Muncy, Pa.

### INDUSTRIAL MIXERS

New brochure covers a complete line of shear-flow industrial mixers.

Included in the literature is an explanation of the mixer's design and operation principle, mixer sizes, weights and horsepower available.

Featured is the introduction of the new shear-flow continuous mixer describing its principle, function and available sizes.

Gabb Special Products, Inc., Dept. PVP, Windsor Locks, Conn.

Why buy solvents the hard way?

Use ESPESOL SOLVENTS' new, simplified

ONE SOURCE SUPPLY

Buy all your solvents at one place . . . at one time . . . for increased profits.

- Save on Freight Costs — Smaller, multi-product orders are shipped in compartment lots by tank car, transport truck, barge and ship and enjoy bulk rates.
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- Immediate Availability — Signal Oil's conveniently located terminals insure quick delivery to all points.

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Chicago Office: 1515 N. Harlem, Chicago, Illinois, Phone VI llage 5-5410
Cleveland Office: 20800 Center Ridge Rd., Cleveland, Ohio, Phone EDison 3-0180
Louisville Office: 4th and Broadway St., Louisville, Ky., Phone JUniper 3-7634
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Long Beach Office: 2828 Junipero Ave., Long Beach, Phone NEvada 6-3301

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29.4% of the combined chromate plus extender pigmentation is made up of Celite 266 in Shawinigan Resins Wash Primer formula B1001. In formula B1002, the Celite proportion is 28.3%. For full details write for Brochure on Butvar® and Formvar® in wash primers. Address Shawinigan Resins Corporation, Springfield 1, Massachusetts.
Wash primers that don't settle go on fast and easy

# To assure a soft dispersible cake Shawinigan's formula B1001 calls for Celite diatomite

IN polyvinyl butyral wash primers, Celite's* high bulking action and unique particle structure help control hard packing to assure easy application, stability and good performance. Being inert chemically, Celite also provides non-reactivity and compatibility with wash primer pigments. Irregular microscopic Celite particles also promote adhesion of top coats when they are present in primer formulations.

Find out how Celite helps combat hard pigment settling in wash primers. Write for further information to Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

Johns-Manville CELITE Diatomite Pigments

### FILLING MACHINES

A six-page, two-color illustrated bulletin describes piston-type fillers for liquid, semi-liquid and semi-solid food, chemical and drug products—machines featuring exceptional versatility, rapid filling by bottom-up or clean cut-off, ability to handle delicate products, and quick, easy changeover and cleaning. Specifications and production capacities are shown for one-operator machines from a two-line model to a high production 12-line machine filling up to 290 containers a minute. Construction and operational features that make for production economies and long, maintenance-free life are explained. Special purpose machines such as gallon fillers, batter depositors and processed cheese fillers are also shown and described.

The Filler Machine Co., Inc., Dept. PVP, 10 Penn Ave., Philadelphia 11, Pa.

### ETHYL ALCOHOL

New 150-page book describing properties and types of industrial ethyl alcohol has just been published. The book contains complete commercial data on pure ethyl alcohol, denatured alcohol and proprietary solvents, as well as calculations for reducing proof, test methods, government regulations, and a wide selection of physical properties (including specific gravity tables). The text, tables and charts are fully documented

Government regulations, an important factor in the industrial alcohol business, and presented as a separately bound supplement, in a back cover pocket. Plans are, says U. S. I., to reprint the supplement as regulations change.

Technical Literature Dept., U. S. Industrial Chemicals Co., Dept. PVP, 99 Park Ave., New York 16, N. Y.

### MATERIALS HANDLING

A package of seven case history bulletins describing paper handling techniques with materials handling equipment by major printing or paper warehousing suppliers, is available.

The most efficient and economical methods of handling rolls and flat paper during warehousing—in-plant movement, order picking, shipping and receiving operations—are fully described in the text and supplemented with action photos taken at each plant.

Lewis-Shepard Products, Inc., Department PVP-R10-23, 125 Walnut St., Watertown 72, Mass.

### ZINC OXIDE

The most recent literature on the use of zinc oxide in latex paints is a brochure entitled *Zinc Oxide in Water Emulsion Paint Systems.*

Among the features of this new brochure are actual color pictures of exposure tests showing surfaces protected with paints formulated with and without zinc oxide. Also included in the brochure are recommended formulations developed by research technicians.

The Eagle-Picher Co., Chemicals and Metals Div., Dept. PVP, Cincinnati 1, Ohio.

### VALVE LUBRICATING SYSTEM

An automatic lubricator for lubricated plug valves is described in a new bulletin. The booklet shows the construction of the lubricator, tells how to install and operate it, and gives information necessary for the device's adjustment.

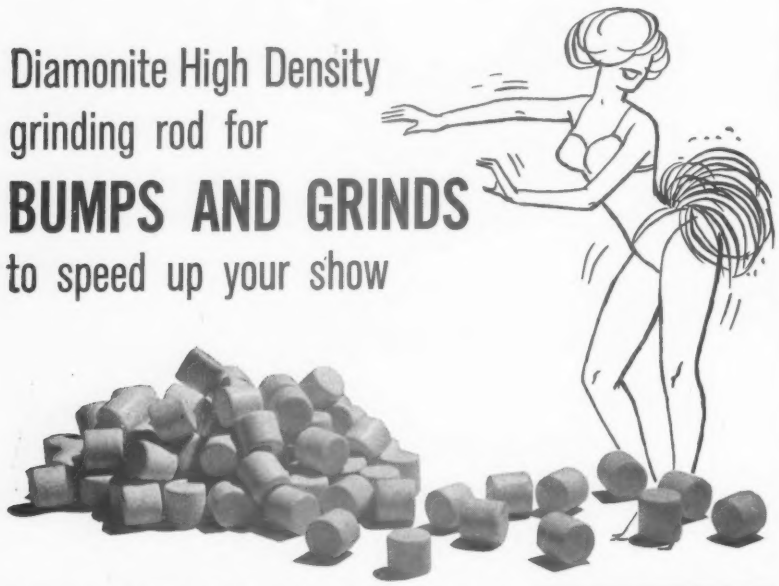
It is adjustable so that lubricant is furnished only when the valve requires it, avoiding the waste of lubricant.

Rockwell Mfg. Co., Dept. PVP, 400 North Lexington Ave., Pittsburgh 8, Pa.


Diamonite High Density grinding rod for

**BUMPS AND GRINDS**

to speed up your show



Why put up with old-fashioned bumping action when modern Diamonite Grinding Rod gives you bumps and grinds that cut milling time up to 50% and more. And, Diamonite high Alumina Ceramic wears longer—minimizes contamination and is highly corrosion resistant as well as impervious to liquids.

**Go Modern Now**—no need to wait to make a full charge of Diamonite Grinding Rod—use it for make-up—start to enjoy the savings *now*. Naturally the higher the percentage of Diamonite Grinding Rod, the higher the production record—the lower the cost.

**Prices—first cost of Diamonite Rod is comparable with other high density media used in pebble mill operation.**

We'll send *you* a "handful" of Diamonite Rods—see for yourself how they give surface contact many times that of spheres or stones.

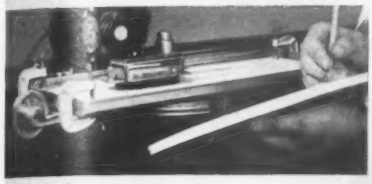
Note in this handful of cylindrical shaped Diamonite Rods how a plane of contact is naturally formed to give surface contact many times that of spheres or stone shapes.

Write for Bulletin, Prices *and* a "handful" of Diamonite Rods.

DIAMONITE products mfg. co. SHREVE, OHIO. DEPT. PV-8

**NEW emulsion paint base!**

# VELSICOL W-617 HYDROCARBON RESIN EMULSION



### SCRUB RESISTANCE

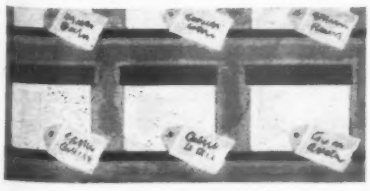
Pigment binding power plus W-617's water resistance feature makes possible paint films that develop optimum scrub resistance rapidly, giving you a really quick drying and very hard wearing paint film.

### TOP HIDING POWER

W-617's high critical pigment volume concentration produces durable films with low specular gloss. Its low angle sheen gives maximum coverage and hiding of under surface imperfections.

### WATER SPOT RESISTANCE

W-617 films have maximum water repellency and minimum re-emulsification advantages created by the non-polar nature of the hydrocarbon base polymer and a specially developed wetting agent system.



### SHELF STABILITY

Continuing tests, after 18 months showed that Velsicol W-617 as the sole vehicle or, used with polyvinyl acetate, styrene butadiene or acrylic latexes have good stability properties under standard storage conditions and under the Federal freeze/thaw specifications.

A specially designed wetting agent system that produces a minimum particle size is the secret for giving you the best film properties. W-617 does just that!

Velsicol's W-617 is a new emulsion paint base created with a polymer of the Styrene-Indene-Isoprene type. The emulsion itself is very stable and can be used as the whole paint vehicle or formulated into paint systems in combination with polyvinyl acetate, styrene butadiene or acrylic latexes. W-617 combined with the conventional paint latexes adds easy film coalescence and all the other wanted film properties.

Top performance and low cost are the magic words that will describe your paints formulated with Velsicol's W-617. Write now for testing samples and complete data.

**NOW AVAILABLE IN COMMERCIAL QUANTITIES! MAIL COUPON TODAY FOR LITERATURE AND TEST SAMPLE!**

**WORK WITH THIS MAN**

*. . . your Velsicol representative, a qualified chemist who can help you make better products for less!*

**VELSICOL CHEMICAL CORPORATION**
**330 East Grand Avenue, Chicago 11, Ill.**
International Representative: Velsicol International Corp., C.A. P. O. Box 1687 • Nassau, Bahamas, B.W.I.

☐ Please send a test sample of W-617 PVP-80
☐ Please have a salesman call

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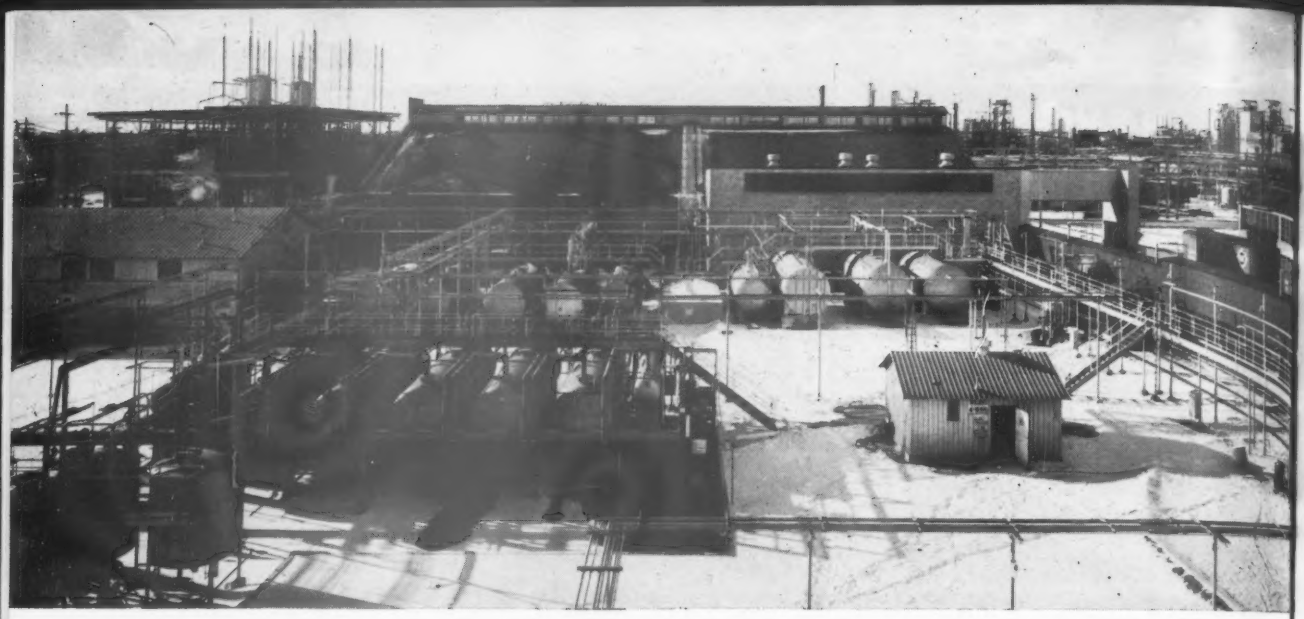
Company_____

Address_____

City_____ Zone____ State_____



# Dow Holds Paint Symposium For Trade Press Editors

**Latex binders are a single ingredient in complex paint formulations. The latex must exhibit compatibility and property development with all other ingredients. Starting point formulations are exhaustively tested in the Dow Coatings Technical Service Labs.**

**Latex production reactors pour out a stream of products useful to paint, paper and building product industries.**

EDITORS of leading magazines in the paint, varnish and lacquer fields attended a paint symposium presented by the plastics department of Dow Chemical Co., Midland, Mich., on June 16.

After welcoming speeches by Paul Harsha, Section Head, Plastics Public Relations, and Harry L. Clark, Coatings, the editors were taken on a tour of the research laboratory.

Walter A. Henson, Manager of the Coatings Technical Service Projects Group, addressed the editors after the tour. He said, "It should be emphasized at this point that prior to even the first attempt to introduce a new product to a customer's laboratory, there have probably been one-three years spent in close cooperative work between our laboratory staffs and our colleagues in one or more of our research laboratories. Our effort is directed to make a given product as nearly ready for the market as we possibly can."

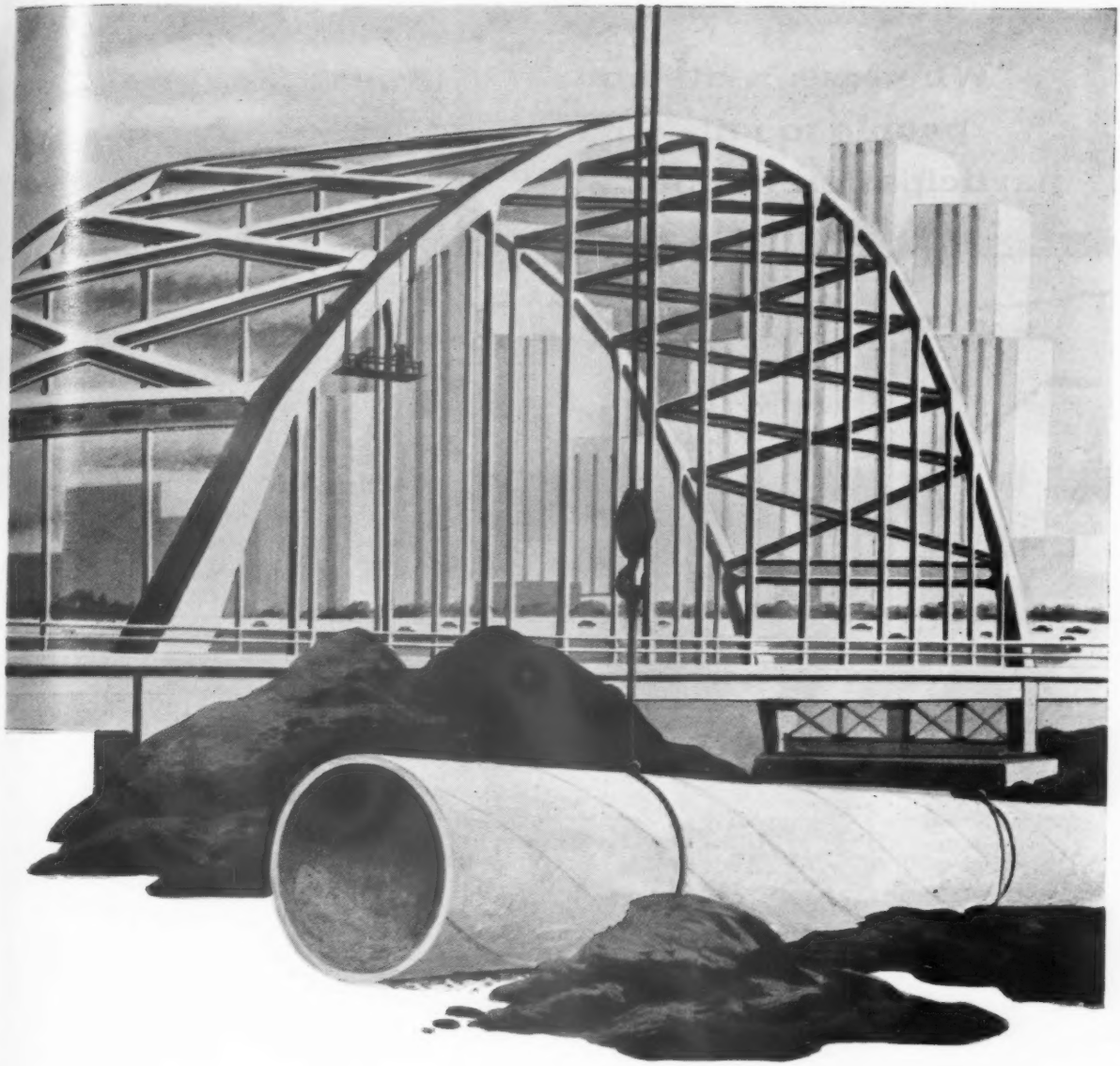
M. C. Carpenter, Manager of the Coatings Technical Service Paint Group, spoke on "Developments Now in Progress." He said, "A paint latex—or a latex useful for any other application—must be designed all the way to provide performance. The research and production people are concerned with more than the production of "styrene-butadiene" or other types of latex. There are many factors other than the monomers employed that influence the end product:

1. Molecular chain length
2. Molecular weight distribution
3. Distribution pattern of the monomers
4. Degree of crosslinking
5. Particle diameter
6. Average particle size distribution
7. Magnitude of charge on the particles
8. Hydrophilic-hydrophobic balance.

Each of these—and many others not listed—is a variable which radically affects end-latex behavior.

"The difference between 'identical' copolymers can be illustrated very graphically by reference to one particular copolymer family, in this instance 60/40 styrene-butadiene copolymers," he said.

Talks on industrial paint products, chemical products, selling, marketing and advertising in the paint field rounded out a very successful symposium.



# Piccolastic

## bonded strength

Piccolastic Resins are thermoplastic polymers of selected styrene. Available in many grades from plastic liquids in the plasticizer class to hard and tough high melting point grades.

Piccolastic Resins are inert and neutral, with excellent water and chemical resistance and are used wherever pale color, strength, and protection are desired.

*The trademark of quality*

**PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION**
**CLAIRTON, PENNSYLVANIA**

## "When we invited our people to join, our participation jumped 20%!"

"Early last month I checked with our Payroll Department. I found that less than 28% of our employees were enrolled in the Payroll Savings Plan. So I contacted our State Savings Bond Director and asked for his help and advice.

"He worked out an effective plan by which every person in our company was *invited* personally to join the Plan. You know, sometimes you hesitate to do a thing like this. Employees may think you are trying to use a little pressure. But the way we did it, there wasn't any pressure at all. We just explained the advantage of this systematic way of investing, and showed how convenient it is. Then we invited them to join with the millions of other Americans who are building personal security—and strengthening our country's peace power—through Savings Bonds. As a result we have better than 45% of our staff enrolled, and our participation is improving every payday."

Is *your* company enjoying the advantages of a substantial participation in the Payroll Savings Plan? Other first-line companies find that helping their people save regularly in U.S. Savings Bonds reduces employee turnover, improves safety records and steps up morale materially. If you'd like to see your company's participation increased, contact your State Savings Bond Director. He'll be glad to help you spread the latest information on Payroll Savings, person-to-person.

NOW! U.S. SAVINGS BONDS EARN 3¾%

PAINT AND VARNISH PRODUCTION

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

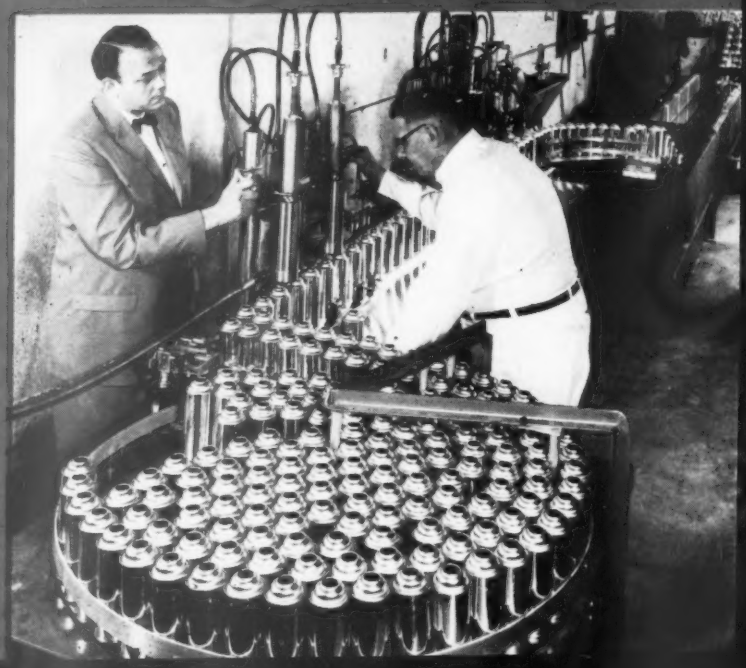
# AEROSOL COATINGS

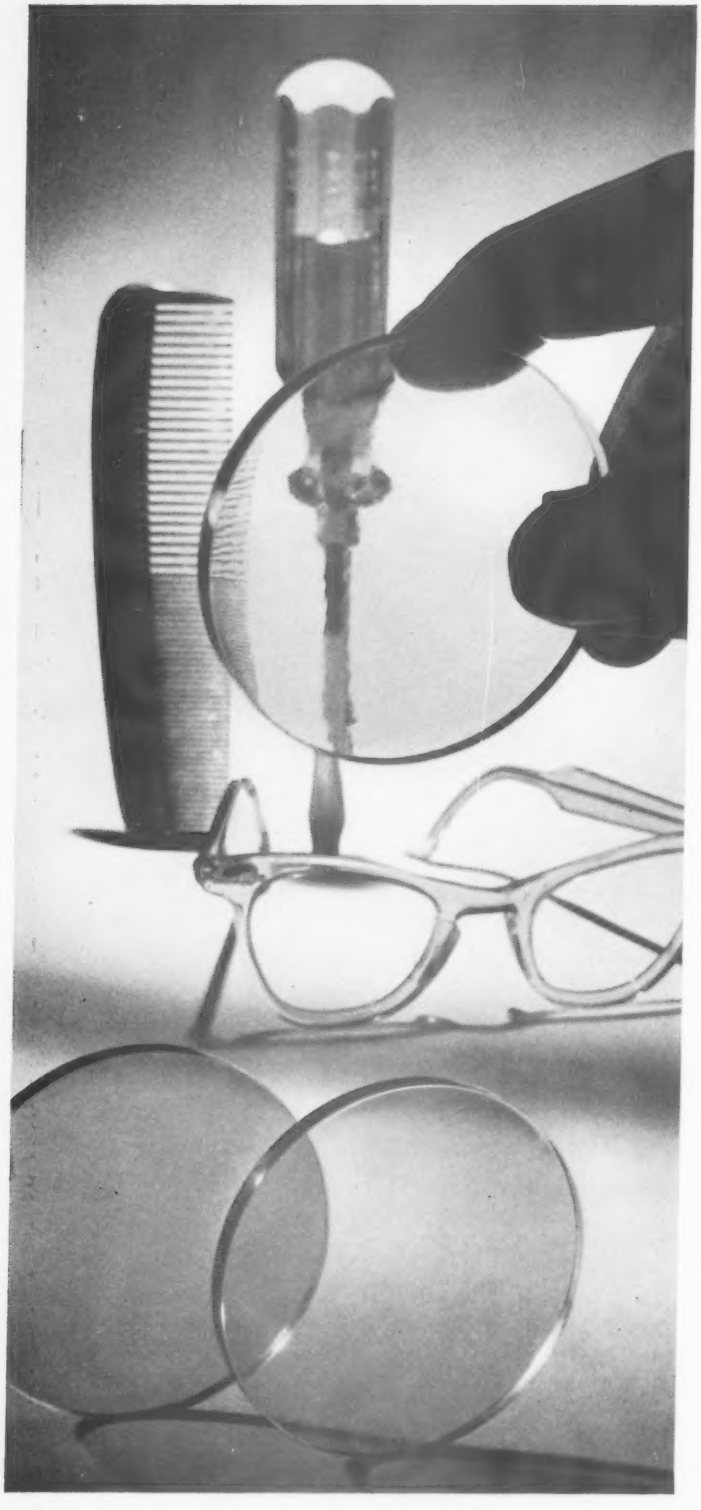
PACKAGING

FORMULATION

PRODUCTION

David T. Stebbins, left, president, Cincinnati Aerosol Co., turns valve that starts production at first custom aerosol filling plant in Cincinnati area. Initial production facilities can fill 432,000 units per week.





# SALES-making SPARKLE and CLARITY

## for cellulose acetate products

You're looking at the results of three methods of improving lacquers and molding powders with new high-quality Du Pont Cellulose Acetate.

This C/A sets a standard for sparkle and clarity. Shown at left are three grades of Du Pont C/A: highest clarity (at top) for brilliance and sparkle, medium grade (lower right) for tinted and pigmented items, and a third grade for opaque products.

**Other properties:** Du Pont C/A is light stable. It is tough. It resists heat. It resists chemicals, grease, oil. It is an excellent electrical insulation.

**Flaked or ground:** Du Pont C/A can be supplied flaked or ground. You can have it in acetylations from 52% to 56% and in viscosities from 3 to 150 sec.

Available in 50-lb. multiwall bags.

For information on pricing and shipping arrangements, call your Du Pont representative, or write Du Pont, Explosives Department, 6539 Nemours Building, Wilmington 98, Delaware.

DU PONT REG. U.S. PAT. OFF. CELLULOSE ACETATE

Better Things for Better Living . . . *through Chemistry*

# AEROSOLS GAIN PUBLIC CONFIDENCE

## CSMA's educational program keeps government agencies abreast of developments in aerosols.

By
E. G. Roberts

THE aerosol industry has established itself and grown not only because of the public awareness of the merits of its products but also of the confidence in the safety of the pressure containers. Generally speaking we have enjoyed a "good press". There have been a few exceptions which however have not harmed the long range development of the industry.

This confidence has in part been due to the fine relationship maintained with the public agencies responsible for the protection of the public in the marketing and use of pressure packages. The Bureau of Explosives, U. S. Post Office, U. S. Dept. of Agriculture, the Federal Food and Drug Administration as well as the State and local officials have recognized aerosols as a desirable part of the American way of life. Helpful in the education involved in the introduction of these new products has been the office of the Chemical Specialties Manufacturers Association, its numerous committees as well as those members of the industry who have taken the time to appear before gatherings of these public offfficials.

Two talks given recently before representative groups are typical of this educational and public relation process. These papers were: "Aerosols-Technical Fire and Safety Considerations" *by C. P. Clapp, Vice President, Western Filling Corp.*, Los Angeles, Calif., presented to the *Southern California Conference of Fire Prevention Inspectors*; and "Weights and Measures in Aerosol Commodities" *by Harry E. Peterson, President, Peterson Filling Co.*, Danville, Ill., presented before the *45th National Conference on Weights and Measures, Washington, D. C.*

Mr. Clapp's paper because of the relative short notice was not an "official" presentation of the CSMA but its view clearly reflect Association's position. Mr. Peterson's paper was prepared at the request of the confidence. Mr. Peterson was selected for the presentation by the Aerosol Division of the CSMA and after the preparation it was reviewed by industry representatives many times prior to final presentation. Both papers are available from the office of the CSMA.

The questions raised and answers in these papers are repeatedly asked by public officials, prospective aerosol marketers as well as the public in general. For this reason their contents are worthy of study by all of us and can well serve as background for similar presentations.

In all such talks, a review of the short history of the aerosol industry, its principles and components as well as examples of various types of products is desirable. Slides and the CSMA "Magic Button" film as well as the films of industry companies fit in very nicely.

**Potential Hazards**

Mr. Clapp in his talk to the fire inspectors followed his introduction by indicating potential hazards which were of the greatest interest to the group. These were concerned with flammability, toxicity and bursting due to pressure.

Relative to flammability he reviewed the ICC tests developed to classify and protect against excessive hazards. These include the flame projection test, the open and closed drum tests and the modified Tag open cup test for flammability. The relationship of these tests to precautionary labeling statements was indicated. Demonstration of some of the tests were performed. Mr. Clapp stressed that the whole effort of the aerosol industry was one of prevention to diminish the hazards of fire with aerosols.

On the question of toxicity, Mr. Clapp felt that the consumer is well protected by Federal and state regulations applicable to both aerosols and other packaged products. To quote from his paper:

"Toxicity can arise from the chemicals employed and must be considered from the standpoint of inhalation, ingestion or skin contact. Federal regulations exist that have adequate protection built in, but most manufacturers go well beyond the requirements of the law in safeguarding their products.—There have been no cases, to my knowledge of serious injury ever resulting from chemical or biological toxicity of an aerosol".

On the subject of pressure, the potential hazard of an aerosol is that it is a pressure vessel hermetically sealed with the internal pressure inevitably increasing with the heat. Hence the precautionary

labeling on all aerosol packages relative to avoiding exposure to high heat. Mr. Clapp reviewed the industry's quality control methods to insure that no defective containers leave the manufacturer's plant.

**Consumer Accidents**

Of particular interest was the result of a survey of consumer accidents involving aerosols. This survey was made in 1957 at which time it is estimated that about one billion aerosols were packed and sold. Survey returns were received from about 50% of the industry representing about 500,000,000 units consumed over a 10 year period. All in all 65 accidents were reported of which only 20 resulted in personal injury, the remainder being limited to property damage. Not one accident was caused by flammability nor did a fire result. This is a remarkable record in comparison with other types of retail merchandise.

The aerosol record on liability claims is a good one. Insurance companies recognize this and most aerosol loaders are classified in the lowest category applicable to consumer goods.

Mr. Clapp concluded his excellent and well received talk with a plea for uniform regulations throughout the country on the packing, storage, shipping and use of aerosols.

**Weights and Measures**

Mr. Peterson talk before the Weights and Measures people was of particular interest since this is the first time the industry was formally presented to this important agency. After his introduction he turned to some of the difficult questions which had previously been submitted and the answers to which made up the bulk of his paper. Since they touch upon such vital concepts in aerosols we will quote most of these questions and answers verbatim.

"*Why is the CSMA qualified to answer questions about weights measures in the aerosol industry?*"

"Through its parent trade association, the CSMA, the infant aerosol industry became well informed on how to fit logically, carefully and commercially into the activities and interests of such organizations as the Federal Trade Commission, the Bureau of Explosives, the Interstate Commerce Commission, the Compressed Gas Association and the U. S. Department of Agriculture. The industry recognized that this new pressure packaging concept required regulation and assistance from all of these groups if it were to grow soundly. As problems were solved and methods were developed, the character and makeup of special committees following these problems changed. Today the CSMA aerosol division has 21 scientific committees investigating and keeping the industry and its members up to date."

"Each of these active committees is considering:

(a) Ways to assure the consumer that he is getting a quality product free of misrepresentation and safety hazard.

(b) Ways to establish quality control in the materials and operations used in aerosol manufacture.

(c) Ways to assist in the clarification and establishment of Government, State and Local regulations beneficial to the consumer and the growth of the industry."

Mr. Peterson then proceeded with the next question which was the most "loaded" of the group.

"*Is the weight of the propellant included in the labeled net weight? If so, why—since the propellant is not a usable part of the product dispensed.*"

"Yes, the propellant weight is included in the designation of net contents because it performs a useful function as follows:

> The propellant (a) supplies pressure to dispense material from the container—a basic justification for the convenience of aerosols; (b) disperses the active ingredient in usable form — thus supplying the peculiar effectiveness of many aerosols; (c) allows the package to be sealed, free from spillage, air contamination, or premature evaporation."

Mr. Peterson then gave several examples of how the propellant works, in insecticides, in insuring that the particle size requirements of the Department of Agriculture are met; in shave creams, in producing the billowy foam. The difficulty of merely labeling active ingredients would be extreme in the case of room deodorants where a can, weighing nearly a pound with contents, had only 1% of perfume. If so labeled; "active ingredient one-tenth of an ounce", the confusion in the mind of the buyer would be great.

The next question is also of special interest to weights and measures people. Its application applies to all aerosols including paints.

"*Why are commodities that have been traditionally labeled by liquid volume being measured by weight in aerosol containers?*"

"The Department of Agriculture insists on active ingredients being marked on insecticide products in terms of percent by weight. The composition of the other ingredients besides the toxicants in an aerosol insecticide can vary substantially. This is so because the nontoxicant portion of the package is a mixture of propellants having densities between 1.3 and 1.45 grams/ml and organic solvents having densities of .75 to 1.0 grams/ml. An insecticide marked 'contains 2% DDT' may appear the same to the consumer in brand X insecticide containing 6 fluid ounces of total formula as compared to brand Y having 6 fluid ounces of total formula. However, if brand X contains 8 weight ounces of formula and brand Y contains only 7 weight ounces of formula, the two products would not contain the same bug killing power. It is the industry's belief after reviewing the requirements of the Federal Trade Commission that designating insecticides by total weight is, therefore, a truer representation of bug killing power and is consistent with the Department of Agriculture regulations on weight percentable of insecticide toxicants".

"The practice adopted for insecticides has been applied to other aerosol products and for some other reasons as well as consistency.

(a) Since the contents of most aerosol containers cannot be seen

and the container cannot be opened, weight of the container and how it feels when shaken are the main indications for comparison of one product with another.

(b) People are more understanding of a 'weight ounce' than they are of a 'fluid ounce'. Most people think of fluids in terms of quarts and gallons.

(c) Many aerosols contain ingredients whose specific volume changes significantly with temperatures. Aerosol products such as hair sprays, insecticides, room deodorants, and paints will experience a liquid volume increase of more than 1 percent for each 10°F. rise in temperature. This is a liquid expansion rate approximately ten times that of water-based products. Using weight designations avoids the necessity of specifying on the aerosol package a temperature of volume measurement."

Not listed by Mr. Peterson, but also an important reason for maintaining the weight system of labeling aerosols, would be the practical difficulties of the weight and measures people and others of measuring by volume anywhere near accurately as a compressed liquified gas, that is, the propellant.

*The final question considered by Mr. Peterson was that of an industry movement towards standard coners for similar commodities.*

The answer to this question is a definite "No". The trend of the industry has been rather towards more diversity in the selection of the container. The first aerosol can was a modified 12 oz. beer can. The expansion to a wide line of products has been made possible by additions of other sizes of tin cans, 4 to 16 ounces, aluminum containers of various sizes and shapes, glass bottles, coated with plastic and uncoated and now pure plastic containers.

Mr. Peterson concluded with the statement that "The 'package sells the product', is not less true in the aerosol industry than for other line of useful products."

Both Mr. Clapp and Mr. Peterson are to be congratulated for their fine presentations and their contributions in promoting public confidence in aerosols.

# Aerosol Developments

## Cincinnati's 1st Custom Filling Plant in Operation

The first Cincinnati plant for custom and contract aerosol filling is now in operation. The new company, the only one in the southwestern Ohio area for the loading of liquid, foam, and paste-type aerosols, is Cincinnatti Aerosol Corp.

The plant was opened to meet the needs of manufacturers in Ohio, Kentucky, and Indiana. Future plans call for expansion into the national field where the firm already serves companies which do not have the facilities for aerosol filling.

The initial production facilities are capable of filling 432,000 units per week. These will be used for insecticides, spray paints, tire cleaners, car polishes, deodorizers, hair sprays, paste products, as well as countless other products. Foods and pharmaceuticals will not be filled by this first production line due to regulations of the Food and Drug Administration.

Three different types of propellants—Freon or Genetron numbers 11 and 12 and nitrogen—can be used for filling. Standard aerosol containers, from 3 to 24 ounces, as well as many bottles can be placed in the production line.

Besides the first building, the firm plans to lease additional warehousing space, up to 20,000 square feet, on adjacent land this summer.

The initial facilities include an unscrambling table, two synchronized fillers, purgers, and can crimpers. Other parts of the line are two synchronized gassers, a heat test tank for container leaks, and labeler. All machinery is new and parts of it are custom built. From the unscrambling table through the final labeling, the entire line is completely automatic.

For propellant storage, there's a 4,000 gallon bulk tank. One tank filling supplies propellants for between 80,000 and 250,000 units.

Continental Seamless Pressure Can.

## Extruded Aluminum Pressure Can Offered By Continental

A 4-ounce, seamless aluminum pressure can has been developed and is being offered by Continental Can Co. The new aluminum container offers unique advantages as a pressure package: a combination of lightness and strength, small diameter for easy handling, greater compatibility with some products other than steel, attractive appearance and excellent resistance to rusting.

Besides the physical advantages of aluminum, the smooth, seamless exterior of this round, 2-piece extruded pressure container provides a surface ideally receptive to multi-color, wrap-around lithography. The lithographing process includes a base coat, up to four color printing and a protective coat of varnish overall. Inside of the can comes either plain or enameled.

The new 4-ounce can is suitable for insecticides, paints and many other products. It has a standard 1-inch opening to accommodate the basic valve designs: spray, stream and foam.

New aerosol products are developed and studied at Union Carbide Chemicals Co.'s new Technical Service Laboratory, located near Tarrytown, N. Y., in Westchester County.

### Union Carbide Opens New Aerosol Laboratory

Highly skilled and specialized technical service to aerosol loaders and marketers will be provided by the new aerosol laboratory formally opened by Union Carbide Chemicals Co., Division of Union Carbide Corp.

Located in Carbide's new, ultra-modern Technical Service Laboratory, the new aerosol facility will enable the firm to greatly strengthen and expand the scope of its Customer Service Program.

Specially established to help aerosol fillers and marketers solve formulating problems, the new laboratory is manned by a staff of chemists who are engaged in a wide range of aerosol research, including studies on water-based systems and problems of emulsion and solubility. To date, a multitude of aerosol products—from adhesive bandages and foot relief sprays to anti-perspirants and fumigants —have come under study and investigation by Carbide's laboratory personnel.

To undertake its highly-specialized work, the new facility has the latest aerosol laboratory filling equipment, including cold and pressure filling units. Aerosol testing instruments include a spray-rate unfit, a spray pattern tester, and a unit for calibrating vapor pressure gauges.

In addition, a network of related scientific instruments is available in the new Tarrytown technical center. This includes a gas chromatograph, an ultra-violet and infrared spectrograph, an Instron unit to test strength of materials, and a three-dimensional microscope for photographing spray patterns.

Carbide's aerosol research laboratory had been located in Millwood, N. Y. The new building accommodates about 100 scientists and a supporting administrative staff. Approximately one-third of the building is devoted to administrative offices and public areas. The remainder is divided into 46 laboratories with 33 adjacent offices.

### Push-Button Paint Soon To Be Number One Aerosol Product

Within three years, spray paint will outsell all other non-food aerosol products on the market, according to a prediction made by Elias Shapiro, Executive Vice President, Plasti-Kote, Inc., a leading manufacturer of aerosol spray paints.

According to Mr. Shapiro, aerosol paints have grown tremendously in the past three years, and he estimated that within another three years, aerosol push-button spray paints will lead non-food aerosol products. "By 1963, hundreds of millions of cans will be sold every year," said Mr. Shapiro.

The aerosol paint firm also announced that sales were up 40 per cent for the first quarter of 1960 as compared to the same period in 1959. Mr. Shapiro said sales are exceeding all expectations, and he expects to announce a vastly expanded advertising and marketing program within the near future.

### Bombrini Names U.S. Agent

Impact Container Corp., 135 Oakland Place, Buffalo 22, has been named exclusive distributor of Bombrini Parodi-Delfino aluminum aerosol containers throughout the U. S., Canada, and Mexico. Impact Container is a newly-formed company headed by Dean M. Rockwell, former sales manager of Tube Manifold Co.

The company said it can offer immediate delivery of high volume quantities of the seamless containers in 3, 5, 7, 12, 18, 35, and 37-ounce sizes. Largest of these is a special high-pressure unit. All are available with epoxy interior coatings and four-color lithograph labeling.

Multakolor in new aerosol package.

### United Makes "Multakolor" Available in Aerosol Packages

After two years of actual test-use under the most rigorous conditions in various cross sections of this country and abroad, United Lacquer Manufacturing Corp., Linden, N. J., announced the release to the general public of the "Original Multakolor" in a new prestige aerosol package.

The culmination of these extensive filed tests has resulted in the highest quality standards of Multakolor Enamel known to the paint industry today.

Multakolor is an all-purpose textured spray enamel with which one can obtain two or more colors in a single application. Available in spectacular decorator colors, Multakolor may be applied to almost any surface — sheetrock, plastic, wood, metal, or composition — used on cribs, high chairs, furniture, lamps, bookshelves, and anything else around the house, or for industrial purposes.

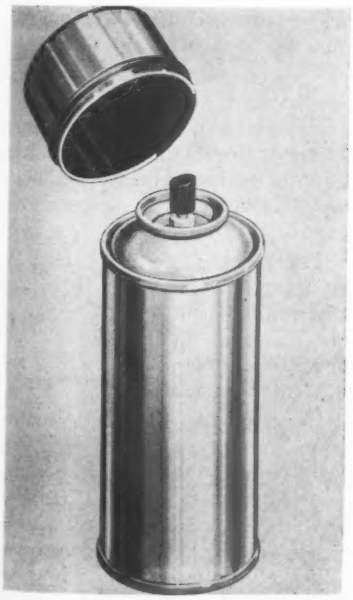
### New Canco Pressure Can Offers Economy Feature

A new pressure can that offers impressive savings for its users was shown by the Canco Division of American Can Co. at the mid-year meeting of the Chemical Specialties Manufacturers' Association in Chicago May 16-18. Of recent development, the "Snap-Lock" pressure can features a cleanness of design, facilitates stacking for counter or floor display, and is adaptable to tamper-proofing.

"The users of pressure cans who adopt this Canco development will be able to cut costs dramatically," according to C. S. Stephens, product manager, non-food containers. "This can makes it possible to employ a single-shell overcap instead of the expensive double-shell caps now in vogue. The new-type caps will be available from a choice of manufacturers who produce metal and plastic caps especially fashioned to fit Canco's "Snap-Lock" pressure cans," he said.

"The beaded overcap enables the user to make his aerosol tamper-proof," the Canco product manager pointed out. "A plastic band sealing overcap to can prevents shoppers from experimenting with the aerosol in the store. It also insures against priced cap-switching," he said.

Mr. Stephens concluded that while Canco is confining present production to the 6-ounce can size, the Division is equipping itself to produce 12-ounce cans.



"Snap-Lock" pressure can made by American Can Co., is adaptable to tamper-proofing.

### Sprayon Products Appoints Three New Regional Managers

Appointment of three new regional managers has been announced by Sprayon Products, Inc., Cleveland 3, Ohio. The move is another step in Sprayon's continuing expansion program, and will result in faster service and closer liaison with present and prospective customers of the company, described as the oldest and leading custom-loader of aerosol specialties.

Edwin O. Bergdahl, associated with Sprayon for four years as a manufacturer's representative, has been named Western Regional Manager, in charge of the 11 western states.

William C. Murphy, formerly with Reynolds Metals Co., has been appointed Midwest Regional Manager, covering western Michigan, Illinois, Indiana, Wisconsin, Minnesota, Iowa and Missouri.

John R. Sinding is the new Eastern Regional Manager. His territory runs from the New England states south to include Virginia, also includes metropolitan New York City and eastern Pennsylvania.

### Dots N' Spots Multi-Color Paint Introduced In Aerosol

Introduction of Dots N' Spots multi-color spray in the popular aerosol spray can for convenient use of the do-it-yourself painter has been announced by Scientific Coatings Co. of Los Angeles.

Already developed and in production, the Dots N' Spots aerosol is the companion product to the previously introduced Dots N' Spots multi-color paint which is applied by a spray attachment.

Available in the same 20 basic color combinations, the new aerosol line makes it possible for the housewife or handyman to spray a variety of household objects with three, four or more colors all in a single application and in just a few seconds. No primer is needed for Dots N' Spots aerosol multi-color spray and it may be applied to virtually any type of surface.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## ORGANIC FINISHES

(*From page 49*)

ceramic frit fillers meets the specifications of MIL-P-14105A. It offers several advantages when so used. These are:

Longer craze life at temperatures ranging from 600 to 1,000 degrees Fahrenheit; improved film flexibility and adhesion after heat aging; and improved resistance to water immersion of the air dried enamel.

Recipes for this and other formulations are available from Union Carbide, although the Silicones Division does not make any paints or enamels.

Paint formulators have also found the new resin effective in the preparation of inexpensive silicone-modified baking enamels to be coated on materials used in the 300-500°F. range. Costs are kept down by the fact that only 10 to 30% silicone resins solids content in the vehicle is needed in such cases.

Choice of colors is unlimited with XR-630, since it is virtually colorless itself. Color retention, initial gloss, gloss retention and non-yellowing properties are excellent. For example, applied to cold-rolled steel panels, paint films based on XR-630 pigmented with rutile titanium dioxide dried to the touch in 15 minutes at room temperature, and did not yellow even when held in air at 500 degrees Fahrenheit for 60 days. Gloss retention of 75% of the original was measured after this gruelling test.

To develop optimum film hardness and corrosion resistance, especially for appliances and other articles that will be subjected to high temperatures, curing the coating from 30 minutes to 2 hours at 400-500°F. is recommended. XR-630 based finishes may be applied by any of the conventional methods: spraying, flow coating, dipping, or brushing. While a clean surface is always recommended, the fact is that XR-630, if properly applied, will not "crater out" where minute dust contamination is encountered. Furthermore, because it has a reasonably fast air dry, the danger of dust pick up prior to bake out is considerably reduced.

Another product, "Union Carbide" R-64 Silicone Resin when blended with aluminum paints will provide protection in the 500-1200°F. range at relatively low costs, as only 7 to 11% by weight of the resin is needed in the formulations. Aluminum paints of this type are now made which can be applied by brush or spray, and which will retain their silvery look even when heated to 1200°F. In the aviation fields, jet engine systems can also be protected with such finishes.

The Allied Paint Manufacturing Company, of Tulsa, Oklahoma, has developed a line of paints which will withstand 700 degrees Fahrenheit. One of this type is a copper pigmented paint with a 50% silicone resin content which was developed in cooperation with Union Carbide's paint and protective coating specialists at Tonawanda. Allied supplies paints to various manufacturers, including makers of indoor and outdoor barbecues.

As has been indicated above, today's films have the inherent toughness of the organics plus the thermal stability and weathering qualities of the silicones. Still further advances are not far in the future. Union Carbide research in the field of paints and pigments is continuing.


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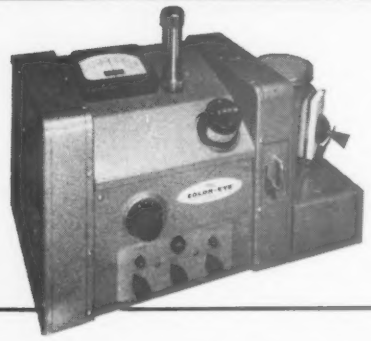

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### American Tung Oil Assn. Announces Sept. Convention

The American Tung Oil Assn. has announced its 1960 convention will be held at the Edgewater Hotel, Biloxi, Miss., September 27-29.

A meeting of the executive committee in New Orleans also named C. W. Goodyear Jr., of Bogalusa, La., chairman of the general convention committee.

The committee also named W. W. Kilby, Poplarville, Miss., as chairman of the Joint Committee on Sampling, Oil Content and Statistics, a committee which was initiated last year.

Participating in the executive committee meeting in New Orleans were: Otis A. Rosborough Jr., Marianna, Fla., Chairman; J. Riley Rankin, Poplarville, Miss.; C. W. Goodyear Jr., Bogalusa, La.; Marshall Ballard Jr., Lumberton, Miss.; W. F. Warren, Lumberton, Miss.; and R. R. Becke, Poplarville, Secretary.

## 2-NITROPROPANE

(*From page 36*)

have shown excellent flow and film properties. Of the two formulas the first is somewhat superior.

I. 2-Nitropropane — 25% by vol.
Cellosolve Solvent — 25%
n-Butanol — 10%
Xylol — 40%

II. 2-Nitropropane — 20% by vol.
Butyl Cellosolve — 20%
Isopropyl alcohol — 10%
Xylol — 50%

### Solvents for Polyurethanes

A more recent development where 2-nitropropane is finding use is in polyurethane finishes. Solvent reactivity with isocyanates seriously limits the solvents available for use in this field, but 2-nitropropane with an isocyanate equivalent of 7000 is essentially non-reactive. Also, the extremely low water content and tolerance of 2-nitropropane means no special grade of the solvent is necessary. Storage of prepolymers and one package coatings at elevated and reduced temperatures in 2-nitropropane solvent systems has shown the system to be stable. 2-Nitropropane is also a good solvent for many of the polyesters used in some of these coatings. Flow of coatings cast from 2-nitropropane, xylol solvent systems is equivalent to those cast from Cellosolve Acetate-xylol mixtures, and chemical resistance of films from formulas built around 2-NP is also improved in many cases.

### Use in Acrylic Lacquers

2-Nitropropane is an excellent solvent for use in acrylic lacquers because of its excellent solvent action and improved application properties. Cutting time required to put solid acrylic resins in solution can be reduced with 2-nitropropane as shown in Table II. Solution viscosities are also low particularly with the less soluble methyl methacrylate resins. Figure 13 shows viscosities of Lucite 41 solutions in various solvents, and illustrates the low viscosities obtained with 2-nitropropane.

**Table II**

| Solvent | 100% Solvent Time to Solution | 60% Solvent 40% Toluol Time to Solution | 30% Solvent 70% Toluol Time to Solution | 10% Solvent 90% Toluol Time to Solution |
|---|---|---|---|---|
| 2-Nitropropane | 2½ hours | 1½ hours | 1½ hours | 2 hours |
| MEK | 1 hour | 1¼ hours | 1¼ hours | 2¼ hours |
| MIBK | 10 hours | 4½ hours | 3 hours | 3 hours |
| n-Butyl Acetate | 5 hours | 3¾ hours | 3½ hours | 3 hours |
| Cellosolve Acetate | 3½ hours | 3¼ hours | 2½ hours | 2¾ hours |

All samples based on 10 gram Lucite 41 per 100 ml. solvent

**Table II. Time to obtain complete solution of Lucite 41 in various solvents.**

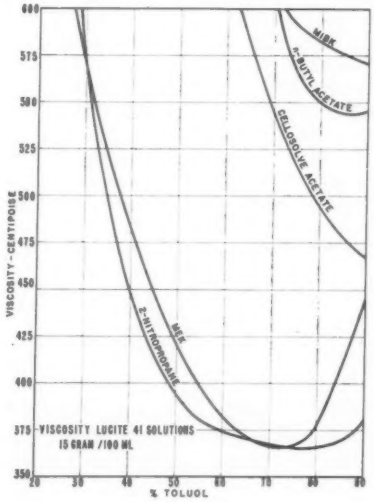


**Figure 12**

### Aids Pigment Dispersion

A very unique property of 2-nitropropane has been its value as a pigment-dispersing aid. This use was suggested by Zettlemoyer[2] in his work on the character of the pigment-vehicle interface. The value of this property of 2-nitropropane has been shown in a number of applications, but one of the more graphic has been improved gloss retention of weathered vinyl films. This same effect has also been noted in vinyl red lead primers exposed to nitric acid. Here the formula ground with resin cut in 2-nitropropane shows greater resistance to discoloration due to oxidation of the red lead by the nitric acid. While these illustrations are limited to vinyl resin applications, improvement in pigment dispersion has also been noted in other systems including alkyd formulas where only small amounts of 2-nitropropane were used in the grind.

The formulation flexibility possible with 2-nitropropane and the improvements in film properties which can be obtained with its proper use are making 2-nitropropane useful in ever wider areas in the coatings field.

**Reference:**
(1) A. M. Cooke, Percent Solids is Obsolete, Paint Oil and Chemical Review, Vol. 121, No. 20, pp. 8-10.
(2) Dr. A. C. Zettlemoyer, The Pigment Vehicle Interface, Official Digest, Vol. 29, No. 395, pp. 1238-1271.

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# LAKOKRASOCHNYE MATERIALY I IKH PRIMENENIE

Paint technology is being given greater emphasis in the Soviet Union with the introduction of the new Soviet journal, *Lakokrasochnye Materialy I Ikh Primenenie* (Lacquer and Paint Materials and their application). This is the first official and only Soviet publication devoted wholly to paint and lacquer technology. Formerly, articles pertaining to this subject were generally published in the Soviet Chemical magazines.

This journal will be published six times a year as the official publication of the government's committee for chemistry of the USSR Soviet of Ministers. It will publish original papers (theoretical and applied) on the synthesis, production and uses of various raw materials used in paints plus articles on processing techniques and applications methods. Economics and organization of the industry, information on new Soviet products, reviews and assessment of specific areas of the paint field will also be covered.

In the interest of keeping you abreast of the many developments taking place in the Soviet paint field, the editorial staff of PVP will regularly publish abstracts from this new Soviet publication each month. These gleanings will give you a unique insight of the Soviet paint industry and its progress. Furthermore, it represents a "first" for PVP in foreign coverage of the paint field. Your comments will be most welcomed.

**Soviet Paint and Lacquer Industry Plans in the 1959-1965 Period.**
*Zezin, N. S. Lackokrasochnye Materialy i Ikh Primenenie, 1 (1960), 3-5.*

As compared with 1959, the production of paint-lacquer materials should have doubled in 1965. The seven-year plan calls for a major program of enlarging the production of both paints and raw materials such as synthetic lacquer resins and pigments, and of building new plants. A sixfold increase in capital volume over the 1952-1958 period is anticipated. On the technical side, one of the most pressing tasks is the increase in specific weight of synthetic film-forming substances for the paint and lacquer industry; 5.1 times more synthetic lacquer resins will be produced in 1965 than in 1958. Oil-free emulsion (latex) paints will occupy a major place in the production volume, resulting in a saving of some 250,000 tons of vegetable oils in the seven-year period. A total 2.6 increase in pigment production is envisaged; titanium pigments will be produced in amounts ten times larger than current production. The following production increases are planned for individual materials:

| | |
|---|---|
| Alkyd, oil, and bituminous lacquers, including semi-products and siccatives | 123.6% |
| Enamels and primers on chemically drying binders | 155.0% |
| Solvent-type lacquers, enamels, and their solvents | 800.0% |
| Cellulose-ester lacquers, enamels and their solvents | 105.1% |
| Water-emulsion paints | 8,000.0% |

Other plans concern improvements of application techniques, automation, and the establishment of a research institute for technology of paint and varnish coatings.

**Investigation of Some Side Reactions in Alkyd Resin Synthesis.**
*Bogatyrev, P. M., Shtan'ko, N. G., and Gol'da, N. M. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 6-13.*

The formation of polyglycerides and polyglycerols during the synthesis of glyphthalic resins occurs both in the alcoholysis and the polyesterification stages. When polyesterification is carried out at high temperatures and for a sufficiently long period, as in the formation of resins containing monobasic acids of rosin, the formation of polyglycerols takes place mainly in the polyesterification stage. The polyglycerols have a pronounced effect upon the quality of the resin produced. Aside from the polyglycerol formation, an important role in the synthesis of glyphthalic resins based on semidrying oils is played by thermal degradation of complex esters; in technological conditions. This may lead to high losses of phthalic anhydride. Such degradation depends on the temperature and duration of the polyesterification, on the ratio of hydroxyl to carboxyl groups in the resin composition, and on the alcohol used. The complex-ester decomposition in the synthesis of glyphthalic resins proceeds according to Kraft's reaction.

**Automatic Control of Alcoholysis Process in Alkyd Resin Production.**
*Gol'dberg, K. M., Gel'fandbein, N. M., Fal'kovich, M. M., and Prilutskaya, N. V. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 75-78.*

The described automatic control of the end-point of alcoholysis of vegetable oils by polyalcohols is based on the resistance change of the reaction mixture. The authors have determined the change in electroconductivity of the mixture during alcoholysis, and developed an apparatus designed to control this process; the apparatus consists of two electrodes attached to a recording device (a somewhat modified electron bridge). The described method makes it possible to: 1) determine the optimum stage of alcoholysis of vegetable oils, 2) reduce the duration of side reactions to a minimum, and 3) produce a product of constant composition.

**Electrochemical Investigation of the Protective Properties of Paint and Lacquer Materials and Coatings for Steel in an Electrolytic Medium.**
*Nitsberg, L. V., Yakubovich, S. V., and Kolotyrkin, Ya. M. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 17-23.*

The passivating action of pigment on steel may be determined from the magnitude of staionary-potential increase of steel in pigment suspension.

and also from the decreasing autoreduction rate of steel as assessed from anodic and cathodic polarization curves. The paper also clarifies the effect of basic factors on the passivating action on steel by various pigments, and the dependence of passivation mechanism on pH of medium.

**Film Formation From AEQ. Dispersion of Some Vinyl Polymers, and the Properties of Such Films.**

*Korsunskii, L. F. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 23-31.*

Films, based on aeq. dispersions of some vinyl polymers and polyvinyl alcohol, possess better physico-mechanical properties than linseed-oil emulsion films. The dependence of these properties on temperature, atmospheric humidity, effect of external tension, molecular weight of emulsifier, pigments, and other factors has been established. The strength of these films increases with decreasing molecular weight of polyvinyl alcohol (emulsifier); the latter also determines the degree of film swelling. With increasing temperatures, the polymer changes to a highly elastic state, thus losing on strength; elasticity also increases with higher humidity of the atmosphere. Introduction of pigments results in loss of elasticity, and better strength of films. The paper presents the data obtained during the study of the film-formation process, and of the effects of introducing dispersion films into water.

**Progressive Methods of Preliminary Treatment of Ferrous Surfaces Before Painting, and the Application of these Methods in the Gor'kov Automobile Plant.**

*Shishmareva, L. B. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 46-49.*

A description of the degreasing and pickling processes used at the Gor'kov plant which are said to have considerably improved the quality of the paint coat. Whole bodies of lighter cars are treated in six baths, followed by drying. The treatment consists of two main steps: a simultaneous degreasing and pickling step, and phosphatizing. The degreasing-pickling solution has the following components: 65 g/l phosphoric acid (sp. weight 1.64), 35 g/l $Na_2PO_4$, 25 g/l emulsifier OP-7 or OP-10, and 5 g/l thiourea; the bath lasts 5-10 mins. at temperature of 72-75°C. The phosphatizing solution consists of 38 g/l zinc phosphate, 76 g/l sodium nitrate, 2.7 g/l sodium fluoride, and 5 g/l iron shavings; the temperature of the bath is 80-84°C, for 4-6 minutes. Other degreasing and phosphatizing compositions are given in the paper, showing their characteristics and application conditions. In describing the experiences with this sequence of six baths, the author shows the composition of each, and the preparation of each bath. Compositions for hot or cold phosphatizing are given. A solution for degreasing and pickling of ferrous surfaces, based on the use of $H_2SO_4$, consists of 75 g/l sulphuric acid (sz. weight 1.84), 25 g/l emulsifier, and 0.2 g/l thiourea.

**Protective Action of Primer Coatings for Magnesium Alloys.**

*Vasserman, P. I., and Chebotarevskii, V. V. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 50-57.*

The drawback in using magnesium alloys in the aviation industry is their low stability against corrosion. The authors studied the protective action of glyphthalic (ALG-7, ALG-8), polyvinylbutyral (AG-9), aluminum (AO), and butylmethacrylate (AG-10) primer coatings, by determining their permeation to humidity, swelling, adhesion, stability to action of alkali, and the electrochemical behavior of the alloy under its primer coating. Taking into consideration certain requirements such as stability to higher humidity and to alkaline media, some fundamentals were established regarding the coating composition and properties: 1) the film-forming substance should impart to the coating a very low humidity permeability, and high adhesion; it should not contain any water-soluble substances; it should be stable to action of alkali, and to slow down the corrosive process; 2) a passivating pigment should be introduced into the composition of the primer: good results were obtained with addition of 25% zinc chromate; 3) a neutral oxidizing film, with high adsorption, should be applied to the alloy surface before the application of the primer.

**Degreasing and Pickling Processes Using Ultrasonic Waves.**

*Agranat, B. L. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 58-62.*

A study of the effect of ultrasonic waves on degreasing and pickling processes for cleansing metallic surfaces from grease and rust. Pickling in an ultrasonic field accelerates the cleansing action, improves the quality of surfaces, and decreases the consumption of pickling acid to 50-60% of the amount needed normally. As a result, 2-3 times more material can be treated in an equivalent volume of solution. Some of the particular effects of metal cleaning in ultrasonic field are: the cleaning action is more rapid (from 5 to 40 times); depending on temperature, concentration and composition of pickling solution, the process takes between 0.6 and 6 min.; cleaning high-temperature scale is accelerated many times; an increase in the intensity of ultrasonic field reduces the duration of pickling process, and renders it less dependable on the temperature of pickling solution; increasing the concentration of sulphuric and hydrochloric acid (by 6-15%) somewhat accelerates the pickling process (except at higher temperature); the concentration fall of the pickling solution is smaller; losses of metal are lower 3-5 times; the resulting surface of metal has much higher quality. The author also cites other advantages, such as possibility of mechanization.

**Study of Absolute Viscosity of Alkyd Bases.**

*Gol'dberg, M. M., and Kazanskii, Iu. N. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 68-71.*

The need for a suitable method of determining absolute viscosity of alkyd lacquer bases (synthesized from glycerol and phthalic anhydride, and modified with vegetable oils) has led the authors to specially modify the automatic laboratory viscosimeter GOI. The modifications, calibration and use of the apparatus are described; the device is presented in a schematic drawing and on a photograph. The described method varies in accuracy from $+2$ to $\pm 10\%$, depending on the temperature; it permits the determination of absolute viscosity of alkyd lacquer resins of varying degrees of condensation in a temperature range of 80-250°C. The paper offers some suggestions concerning the design of viscosimeters for use in the wide temperature range in the manufacture of alkyd bases. The method is said to be also suitable for determination of absolute viscosity of lacquer resins other than alkyds.

**Determination of Zinc Oxide Content in Rutile.**

*Kazmenko, I. A., and Tabunchenko, V. N. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 72.*

A simpler and more rapid method for determining small amounts of ZnO in titanium dioxide (rutile) is described, using the sodium salt of anthranilic acid. The procedure takes about two hours.

**Improvement of Artificial Weather Apparatus.**

*Tatevos'yan, G. O. Lakokrasochnye Materialy i Ikh Primenenie, 1 (1960), 73-74.*

Some drawbacks of domestic and foreign-made weatherometers are eliminated by a control device designed to automatically report on faulty operation of the key parts of these meters. A loud signal reports breakage or faulty operation, and a light goes on indicating the trouble spot. An electrical time-measuring device is a part of this automatic signallying system.

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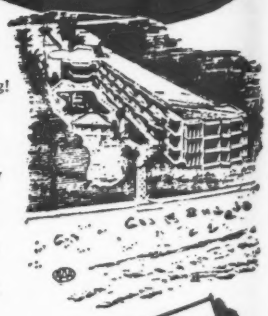

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# NEWS

NEWS OF COMPANIES, ASSOCIATIONS
TECHNICAL GROUPS
ITEMS OF GENERAL INTEREST

Pictured above is the sales group that attended the Neville Co. semi-annual sales meeting. Standing from left to right: Charles N. Beck, Technical Correspondent; E. Glenn Isenberg, General Sales Manager; James Driscoll, Advertising Manager; and technical representatives, James B. Steen, William Craig, Dale F. DeBlander, John P. Villing, Donald L. Marsh, and Walter F. James, Export Manager. Kneeling are technical representatives David N. Clark, William T. Cloake, and W. J. Williams.

Carl E. Larson, second from right, of Dewey and Almy Chemical Division, W. R. Grace & Co., receives Distinguished Salesman Award for achieving best 1959 sales record among salesman in Dewey and Almy's Organic Chemicals Division. From l-r: Thomas G. Gibian, general manager of Organic Chemicals Division; George W. Blackwood, Dewey and Almy president; Larson; John G. Broughton, Organic Chemicals sales manager.

## Onyx Forms New Corporation

Onyx Oil & Chemical Co., Jersey City, N. J., was merged with the Onyx Chemical Corp. on March 31. The name of the new company is now known as the Onyx Chemical Corp.

Onyx Chemical Corp. has publicly held and recently acquired all of the outstanding shares of the actual stock of Onyx Oil & Chemical Co. It will carry on the half-century business under the same management and at the same locations.

Onyx Chemical Corp. is one of the leading producers of pigment suspension agents, resins, and other related raw materials for the paint industry.

## New Weekly Publication Reviews Technical Articles Published in Soviet Press

A weekly review of scientific and technical articles appearing in the Soviet press and of significant new Russian books is now being published by the Office of Technical Services, Business and Defense Services Administration, U. S. Department of Commerce.

Called *Current Review of the Soviet Technical Press*, the publication is sold on subscription by OTS at $7 for six months ($2 additional for foreign mailing).

The time lapse between appearance of an original article in a Russian publication and its review in the *Current Review of the Soviet Technical Press* is no more than a few weeks and usually within a month, according to OTS.

The reviews cover articles in many fields of science and technology, including metals, ceramics, electronics, use of ultrasonics, mechanical engineering, aviation, radioactivity and radiation in industry, oceanography and meteorology, and activities in space.

While articles are not translated in their entirety, each review gives a citation to the original Russian publication, including page numbers.

The reviews are prepared by an agency of the U. S. Government for its own use and turned over to OTS for publication in the interest of American science and industry. This publication is a new feature of the OTS program of collecting and distributing translations, digests, and abstracts of foreign technical information.

## DeVilbiss Moves

The St. Louis factory branch of The DeVilbiss Co. has moved to a new building in the Page Industrial Center at 1501 Fairview, St. Louis 32, H. M. Kidd, vice president-sales, has announced.

The new building houses the area sales office, engineering and service center, and provides warehouse space for a full selection of the company's products. The building is 100 x 148 feet providing more than 13,000 square feet of space. The modern, fire-proof construction utilizes concrete block and brick. An asphalt-paved parking lot will accommodate 40 cars.

# NEWS

### Pigment and Chemicals To Represent Diamonite

Diamonite Products Mfg. Company, Shreve, Ohio, announces the appointment of The Pigment and Chemical Co., Ltd. as exclusive representatives in Canada for Diamonite high density alumina ceramic grinding rod.

The Canadian company is headed by Mr. Robert W. Dickson, President, and Mr. R. W. Johnson, Vice President, with headquarters office at Montreal. Warehouses are also maintained at Toronto, Quebec City and Vancouver.

Diamonite grinding rod will be sold by Pigment and Chemicals Co. to the paint, varnish, ceramic, drug and other fields using pebble mills. It is claimed by Diamonite that its grinding rod will reduce milling time up to 50% and wears longer than ordinary materials. Further, it minimizes contamination and is highly corrosion resistant as well as impervious to liquids.

### Ashland to Increase Capacity

Ashland Oil & Refining Co., Ashland, Ky., announced that in response to the additional demands for napthalene and benzene, it will increase by 25 percent the capacity of its proposed commercial hydrodealkylation (Hydeal) plant, and will locate the unit at the company's largest refinery, at Catlettsburg, Kentucky, near Ashland, where favorable normal weather conditions during the winter period of construction will permit the earliest possible completion.

The Catlettsburg unit will have an anticipated production capacity of 75 million pounds per year of napthalene and 15 million gallons per year of benzene.

The company had originally announced plans to construct the first Hydeal unit at its Buffalo, N. Y., refinery. Relocation of the unit to Catlettsburg and a substantial increase in capacity is based on completed contracts with five major users of napthalene covcovering 60 million pounds of napthalene or 80 percent of rated plant capacity.

### Hercules Expands Aid

An expansion of Hercules Powder Co.'s aid-to-education program, to provide matching contributions by the company for every dollar given to colleges by Hercules employes, was announced.

Under the new "matching grants" program, the company will equal, dollar for dollar, contributions made by its employes and retired employes to any accredited college or university, up to a maximum of $1,000 for each employe in any calendar year.

"No college graduate fully pays for his education during his years in school," Albert E. Forster, president and board chairman said in announcing the new program.

"As each graduate progresses in his vocation, his success must be attributed partly to the quality of his training. By that premise, an alumnus owes some of the financial reward he earns to the educational institutions which helped develop his capacity for his work," Mr. Forster stated.

**Seven buildings compose the Research Department area of Union Carbide's Technical Center at South Carleston, W. Va. Most of the Research Department buildings were completed in 1949, and were first buildings on the present site. This installation consists of a main office/laboratory building (foreground), an applications research building (center background), a high-pressure laboratory building (left background), a chemicals pilot-plant building (right background), a plastics pilot-plant building (not shown), a radiation laboratory (not shown), a boiler-house-shop building (left center), and auxiliary, structures.**

**Plaques representing three consecutive years of safe operation on the part of the Tin Can Div. of Vulcan Containers Inc., Bellwood, Ill., are held by (left to right) Vern I. McCarthy, Jr., president of the company, Mrs. M. Selk, safety committee member from the division, and E. A. Cognac, Jr., superintendent of the division. The plaques, an award from the Can Manufacturers Institute, will be displayed in a prominent location in the division's section of the Vulcan plant.**

# NEWS

## Phenolic Sales Soaring

Phenolic, the oldest of synthetic plastics, is proving itself to be one of the liveliest as well. Sales topped the half billion pound mark in 1959—an impressive 23 per cent increase over 1958 and more than double the figure registered ten years earlier. Industry leaders expect a 5 to 10 per cent sales increase in 1960, with a steady climb predicted throughout the sixities.

Phenolic is "mature" in the sense that its average annual growth has closely paralleled the growth of the economy as a whole during the last five years. But there has been no stagnation with maturity, Richard H. Bruce, product sales manager for phenolics at Union Carbide Plastics Co., Division of Union Carbide Corp., said. "The combination of thermal and electrical insulation qualities, dimensional stability and ability to greatly up-grade a host of other materials make phenolic one of the master materials of our time," according to Mr. Bruce.

"There is a hard core of applications that seems secure for phenolics," he continued. "Without phenolic as a dielectric, there could be no electrical, automotive, radio and television industries as we know them today. Phenolic gives brake linings the thermal resistance to control modern cars; its use in grinding wheels is essential to metal fabrication," he said.

## Applied Engineering Company Named Sales Representative

Applied Engineering Company, Inc. with headquarters at Orangeburg, S. C., has been named sales representatives in the states of North Carolina, South Carolina and Georgia for NoVo Metering and Mixing Systems used with reactive resins, it was announced.

Applied Engineering, said to be the largest firm of its type in the southeast, maintains additional offices in Atlanta, Georgia, and Greensboro, N. C.

## Sherwin-Williams Licensee Opens El Salvador Plant

The first industrial organization set up in accordance with the common market agreements recently reached by five Central American republics has started operations. It is the Sherwin-Williams Co. de Centro America, S. A., whose $400,000 paint plant in San Salvador, El Salvador, opened earlier this month. The company is a licensee of the Sherwin-Williams Co.

The paint production facilities are entirely owned by stockholders in Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, the countries which are signatories to the common market pact. The board of directors is made up of nationals of the five countries. Stock in the company was issued at a low par value ($4.00 per share) with the express aim of making ownership widely available.

President Jose Maria Lemus of El Salvador was guest of honor at the ribbon-cutting ceremonies marking the opening of the plant.

Head of the new paint manufacturing and distributing firm is Roberto Freund. He is also president of Freund, S. A., a prominent building materials distributing concern.


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# PERSONNEL CHANGES

### ST. JOSEPH LEAD

**Henry E. Pence** has been named Manager of Technical Service for the Zinc Oxide Department. His office is located at the plant in Monaca, Pa.

Mr. Pence has been connected with the firm since 1945. Starting as assistant chemist, he has subsequently held a series of technical executive posts. He was Technical Superintendent of the Zinc Oxide Department from 1950 to 1955 and Assistant Superintendent of the Furnace Plant during 1955 and 1956.

### REICHHOLD CHEMICALS

**Israel Feld** has been named Manager, Technical Service—Surface Coating Emulsions, it was announced.

In his new position, Mr. Feld will be responsible for technical service activities on emulsion coatings of the firm's customers in all parts of the United States east of the Rockies.

**Dr. Jose Zevallos** has been named Manager—Floor Polish Products, it was announced.

In his new position, Dr. Zevallos will be in charge of development, technical and sales services for the company's floor polish products.

### PETRO-TEX

**Dr. Louis J. Croce** has been appointed Supervisor of the Research Dept., Princeton, N. J.

Simultaneously, **Dr. William F. Brill** has been named Research Assocate reporting to Dr. Croce and **Dr. Robert H. Jones** has been appointed Manager of Technical Development.

### BURGESS FOBES

**Walter C. Weber** has been named vice president. Mr. Weber graduated from the College of Engineering at New York University with the degree of Chemical Engineer. He has worked for the National Lead Co. Research Laboratories, Vanadium Corp. of America and the Valspar Corp. in Virginia and New York before coming to Maine.

### HERCULES POWDER

**William N. Tune, Jr.** has been named Director Technical Sales and **Paul H. Eliot** has been named District Manager in Atlanta.

Mr. Tune has been District Manager in Atlanta since 1951.

Mr. Eliot comes to the firm from Titanium Pigments in Cleveland where he was employed in a sales capacity since 1951.

### MCWHORTER

**Saul Heiman** has joined the research and development staff.

Mr. Heiman came to the United States last year from Buenos Aires after serving as assistant to the plant manager of Beckacite S.A., a Reichhold subsidiary.

### METALS DISINTEGRATING

**Frederic T. Cliffe, Jr.** has been appointed Pigment Sales Supervisor, Eastern Sales Territory, it was announced. For three years prior to his present assignment, Mr. Cliffe has handled sales of aluminum and gold bronze pigments in eastern New York State, and products of the Harrison Abrasive Div. in the same area as well as throughout metropolitan New York and New Jersey.

F. T. Cliffe

H. W. Le Boeuf

### GENERAL ELECTRIC

**Harold W. LeBoeuf** has been named manager of manufacturing of the Silicone products department, it has been announced.

He succeeds **Dr. James R. Donnalley** who recently assumed the post of general manager of the company's Insulating Materials Department in Schenectady, N. Y.

### UNITED PROCESS

**Sam S. Como** has been appointed assistant sales manager.

Mr. Como will be concerned with the sales administration of the company's non-destructive coating thickness tester and periodic reverse equipment.

S. S. Como

W. E. Murphy

### ROCKCOTE

**William E. Murphy** has been appointed chief chemist.

Mr. Murphy, who has 32 years' experience in the paint industry, had been serving as chief chemist for Great Lakes Paint and Varnish Co. Previously, he had been with Standard Toch Chemical Co. and Devoe, Raynolds Co.

# CALENDAR

**September 8-10.** Symposium on Physical Processes of Drying and Aging of Paint films, Cleveland Society for Paint Technology, Case Institute of Technology, Cleveland, Ohio.

**September 11-16.** National Meeting of the American Chemical Society, New York City.

### PRODUCTION CLUBS

**Baltimore,** 2nd Friday, Park Plaza Hotel.

**Chicago,** 1st Monday, Furniture Mart.

**C.D.I.C.,** 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmilers.
Columbus — Jan., June, Sept., Fort Hayes Hotel.

**Cleveland,** 3rd Friday, Cleveland Engineering & Scientific Center.

**Dallas,** 1st Thursday after 2nd Monday, Melrose Hotel.

**Detroit,** 4th Tuesday, Rackham Building.

**Golden Gate,** 3rd Monday, Sabella's Restaurant, San Francisco.

**Houston,** Monday prior 2nd Tuesday, Rams Club.

**Kansas City,** 2nd Thursday, Pickwick Hotel.

**Los Angeles,** 2nd Wednesday, Scully's Cafe.

**Louisville,** 3rd Wednesday, Seelbach Hotel.

**Montreal,** 1st Wednesday, Queen's Hotel.

**New England,** 3rd Thursday, University Club, Boston.

**New York,** 1st Thursday, Brass Rail, 100 Park Ave.

**North Carolina,** 3rd Wednesday, Rainbow Supper Club, High Point.

**Northwestern,** 1st Friday, St. Paul Town and Country Club.

**Pacific Northwest,** 3rd Thursday, Washington Athletic Club, Seattle, Wash.

**Philadelphia,** 3rd Wednesday Philadelphia Rifle Club.

**Pittsburgh,** 1st Monday, Gateway Plaza, Bldg. 2.

**Rocky Mountain,** 2nd Monday, Republican Club, Denver, Colo.

**St. Louis,** 3rd Tuesday, Kings-Way Hotel.

**Southern,** Annual Meetings Only.

**Toronto,** 3rd Monday, Oak Room, Union Station.

**Western New York,** 1st Monday, 40-8 Club, Buffalo.

UNION CARBIDE

**Ronald L. Rasmussen** has been appointed Assistant Regional Manager in the South Atlantic Region. Mr. Rasmussen will supervise the sale of polyethylene, phenolic, styrene and vinyl resins and compounds for molding, extrusion and film and sheeting applications.

R. L. Rasmussen

T. G. Gibian

DEWEY & ALMY

**Thomas G. Gibian** has been named vice president of the chemical division.

Mr. Gibian has been general manager of the Organic Chemicals Division, and retains that responsibility.

MONTGOMERY WARD

**John R. Dove** has been appointed paint factories manager.

Mr. Dove, previously manager of the San Leandro, Calif., paint factory, will supervise operations of Chicago Heights, Ill., and San Leandro paint factories.

CONTINENTAL CAN

**Charles H. Marquardt** has been named district sales manager of the Chicago City metal can sales office, it was announced. Mr. Marquardt, who joined the company's sales training program in 1950, had previously been an assistant district sales manager in Chicago and St. Louis.

He succeeds Donald L. Weir, who is transferring to the firm's Hazel-Atlas Glass Division on the Pacific Coast.

GENERAL ELECTRIC

**Robert M. Kavish** has been appointed west coast salesman, with headquarters at San Mateo, California, for the chemical materials department.

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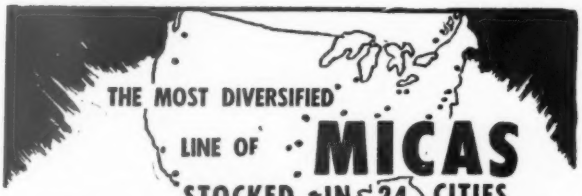
**Correction**

The author of "Auto Fleet Leasing in the Paint Industry" which appeared in the July issue was A. J. Schoen, Wheels, Inc., not A. J. Schoenk, as was incorrectly stated.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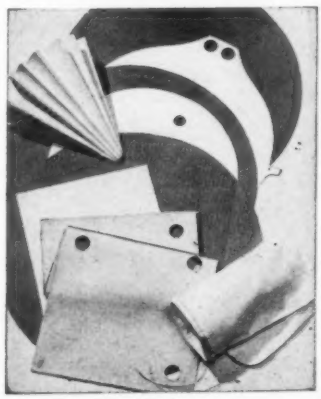

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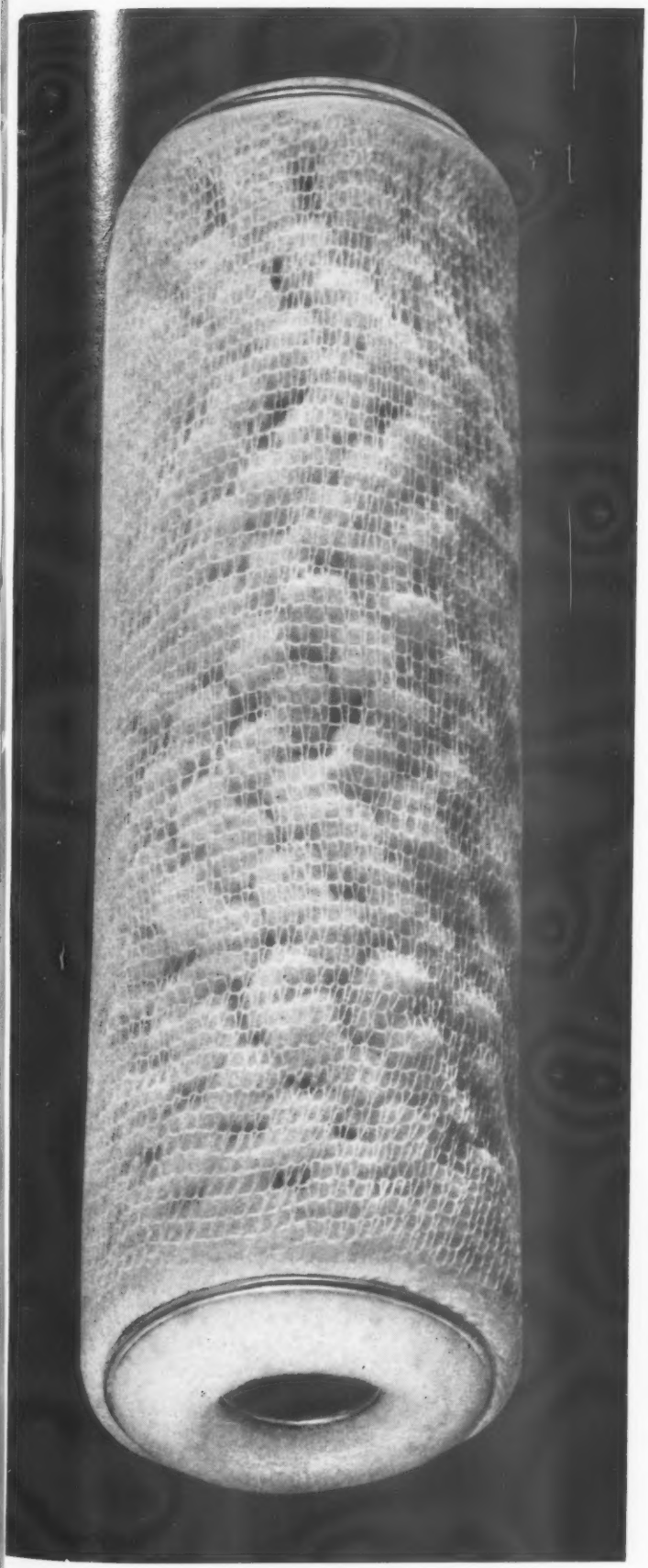

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OVER 60 YEARS OF FILTRATION EXPERIENCE

SHEARING

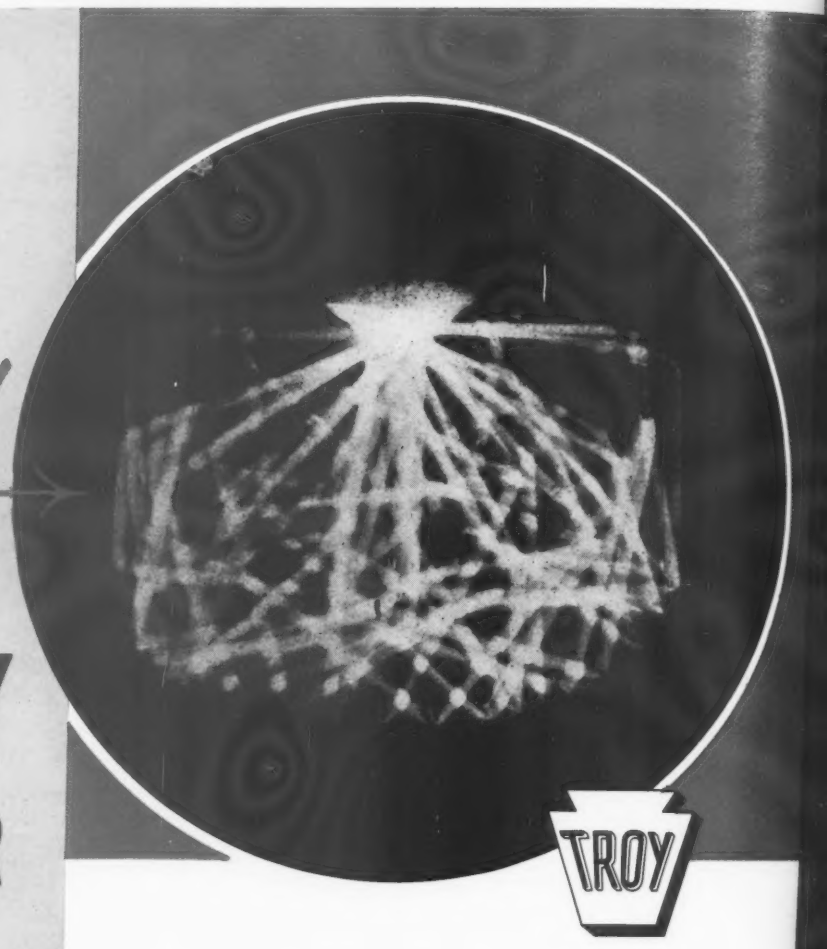
KNEADING

MULLING

# ACTION

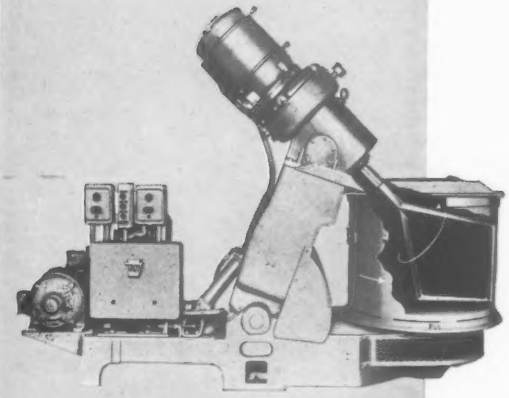
WITH

# TROY ANGULAR MIXERS




The powerful, three-dimensional, TROY action comes alive in this unretouched stroboscopic photograph. With this action, no dry build-up occurs and no scraper is required since the faces of the revolving can are used as working surfaces. Simultaneous vertical and horizontal angular motion rotates and intermingles sheared and mulled solids into a true mixture for fine consistency. Separate single, or two-speed gear motors drive turntable and agitator to give variable mulling and shear ratio on the tank working surfaces.

The results....lower production costs through material that is thoroughly mixed, dispersed and blended in a smooth finished, homogeneous batch — eliminating extra processing in many cases.



**ANGULAR MIXER**

60-Gallon size illustrated

SECO ESTABLISHED 1860

TROY DIVISION

**SKINNER ENGINE COMPANY, ERIE, PA**

Telephone: GLendale 2-3661

, PA